nlgi spokesman

The Challenge of the Sixties to the Grease Industry

By C. J. GUZZO

Lubricating Grease Requirements of the 1961 Cars

By H. ELDRIDGE

Infrared Studies of Greases

By S. E. WIBERLEY, W. H. BAUER and D. B. COX

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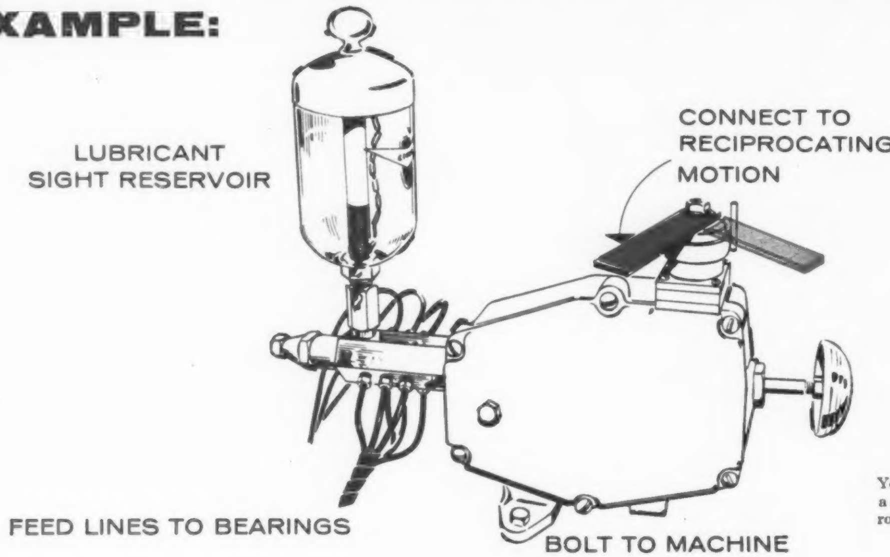

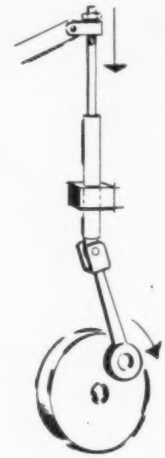

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THE COVER

THIS 1961 Ford on our cover represents important changes affecting lubrication, as explained in Hunt Eldridge's presentation, "Lubricating Grease Requirements of the 1961 Cars" in this issue...the first paper reprinted from the 1960 Annual Meeting. Ford has removed all grease fittings on its new models, employing nine prepacked bearings instead. As explained in the article, the bearings are now equipped with threaded steel plugs, which must be removed every 30,000 miles for relubrication. What this will mean to the automotive lubricant market is explained on page 319.

NLGI PRESIDENT'S PAGE

By F. R. HART, *President*

Building the Annual Meeting Program

The acclamations of the New Orleans 1959 Annual Meeting had barely subsided when the challenge of the 1960 meeting was recognized. It was then that Tom Miller and your newly-appointed program chairman were seen huddled over a sheaf of papers formulating plans for the new year. At the time, it all seemed so simple that the uninitiated may wonder why the ominous forebodings about "getting the job started early." Last January, the light finally broke through when the mailman delivered to my home some 300 letters for review. This file was part of the literary effort expended by past president Sonny Mayor, Jr., which was necessary to make the New Orleans annual meeting a success. It was then that I realized the magnitude of the job ahead and the many problems that could arise. It was also then that I wondered why I found myself in this critical spot.

The fact that changing economic and business conditions were adding to the problem didn't help matters one whit. It just meant that a part of each day must be spent in doing something constructive to whip a new program into shape. This included Saturdays and Sundays—the days we usually set aside for diversionary activities.

And were it not for the wonderful support of a mighty efficient stenographic staff, progress would have been well nigh impossible. To these very capable young ladies, I am forever indebted. In addition, there were many other fears and worries to placate progress. Gradually, these faded and speaker acceptances started coming in. And with them was born the faint hope that hard work and the help of a few well-chosen committeemen might result in an interesting three-day annual program. To those who so generously gave of their time in the preparation of annual meeting papers, thanks again for your timely and valuable contributions.

I feel that each program chairman who preceded me and each one who will follow suffers the same doubts and fears that I experienced during 1960. I also feel that there must be a better way of doing this mighty important job. Perhaps the secretary should be made vice-chairman and the three remaining committee members selected for their willingness to "bend to the oars." Whatever the arrangement, it should be kept in mind that the manifold duties of the program chairman are far too numerous for a person who is actively engaged in a marketing business.

Now that the 1960 Annual Meeting is history, I cannot help but feel a sense of nostalgia in turning over to my successor the problem of developing the 1961 Annual Meeting program. Actually, there is no better way to discover the real, deeper meaning of NLGI or the good work your directorate is accomplishing. I am deeply grateful for the opportunity of being a part of this effort and to have served NLGI over the past seven years. To the new program chairman, you will find the job ahead a worthy challenge!

News About NLGI

Landis Resigns From Board of Directors

Mr. George Landis, manager of the industrial products division of the Atlantic Refining company in Philadelphia, and an NLGI Board member since 1955, has resigned from the Board of Directors because of his October retirement from his firm. Serving as chairman of the

G. Landis

NLGI membership committee, he also worked on the publicity, executive, chassis lubrication, NLGI SPOKESMAN advisory, finance, production survey and nominating committees during his service with the Institute's governing body. He was also a member of the API lubrication committee. Mr. Landis will be replaced in his position as Atlantic's NLGI Company representative by Mr. H. B. Elliott.

NLGI Receives Resolution Of Thanks From IOCA

A unanimous resolution of thanks to NLGI was passed by the entire Active membership at the September 25 annual business meeting of the Independent Oil Compounders Association. IOCA's action of appreciation was for the help given the Association by the Institute during the illness of IOCA's veteran executive secretary, Ralph R. Matthews.

Beginning last July, T. W. H. Miller, NLGI general manager, managed both offices and completed arrangements for the recent IOCA annual meeting. With Matthews retiring and a successor appointed (see People in the Industry), this assistance will gradually cease.

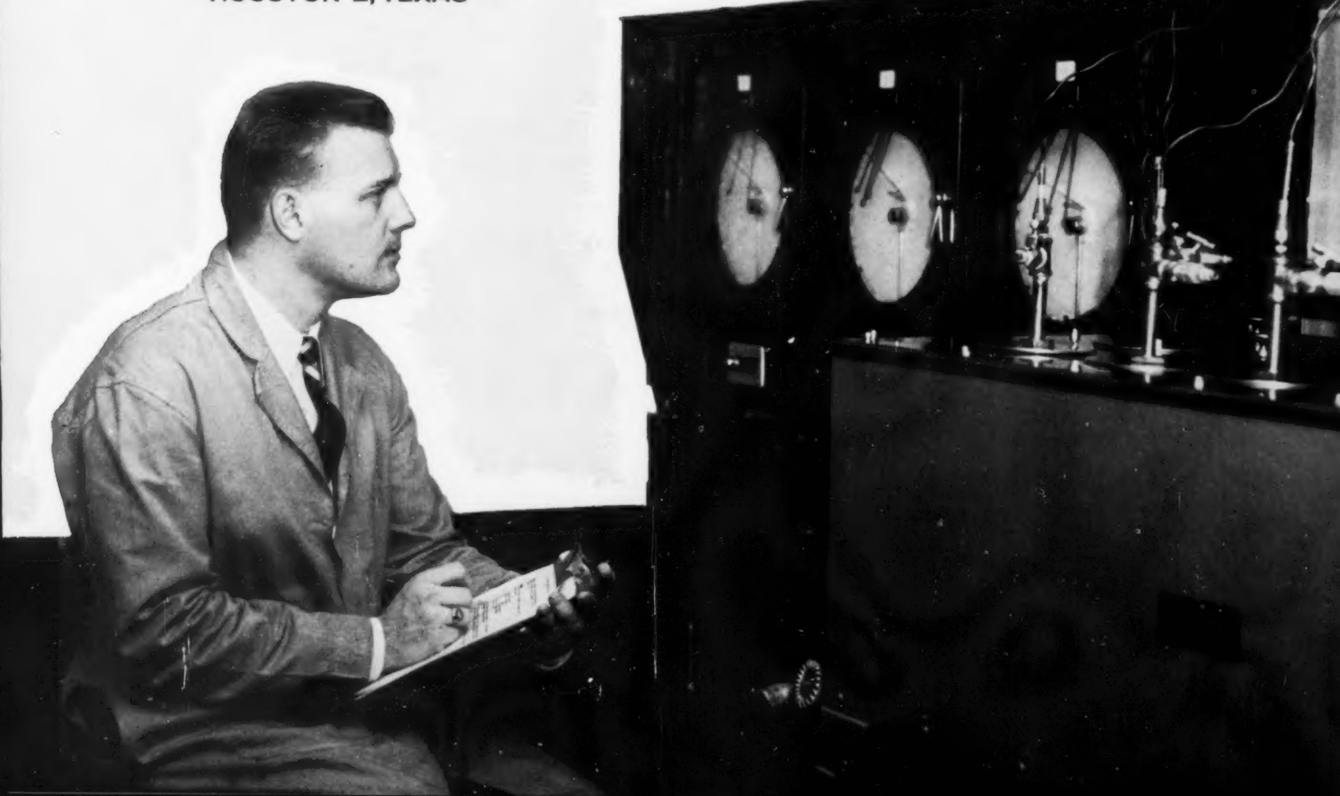
Both organizations have offices in the same building and traditionally, cooperation has been close. The resolution of thanks was delivered to the NLGI Board of Directors, at the NLGI annual meeting.

Analysis of Production Survey in December Issue

In the December issue of the NLGI SPOKESMAN, an analysis of the 1959 production survey will be featured, authored by T. F. Shaffer, past chairman of the production survey committee.

The article will keynote preparation for the next gathering of information . . . Active members are traditionally advised of the compilation at the close of the calendar year in which the next survey will be taken. As before, advance information will be mailed in December, while the actual questionnaires will be sent from the gathering agency in January.

This Institute service is becoming more valuable with each succeeding year, as more comparative data become available. Originated in 1958, the production survey shows pounds produced for 1957, 1958 and 1959 and is becoming valuable for historical trends. Over 78 per cent of the NLGI Active (manufacturing) members participated in the last gathering. All returns are anonymous and the entire project is handled by the management services division of Ernst & Ernst, national certified public accounting firm.



Future Meetings

NOVEMBER, 1960

2 Packaging Institute, petroleum packaging committee meeting, headquarters undecided, New York.

3-4 SAE National Fuels and Lubricants Meeting, Mayo Hotel, Tulsa, Okla.

14-16 API 40th Annual Meeting, Conrad Hilton, Palmer House and Congress Hotels, Chicago.

15-17 Air Force—Navy—Industry Propulsion Systems Lubricants Conference (unclassified), Hilton Hotel, San Antonio, Tex.

27-Dec. 2 ASME Annual Meeting, Statler Hilton Hotel, New York.

JANUARY, 1961

9-13 Society of Automotive Engineers Annual Meeting, Cobo Hall and Convention Arena, Detroit.

FEBRUARY, 1961

5-10 ASTM Committee D-2 meeting, Benjamin Franklin Hotel, Philadelphia, Pa.

APRIL, 1961

11-13 American Society of Lubrication Engineers Annual Meeting and Exhibit, Bellevue-Stratford Hotel, Philadelphia.

19-20 National Petroleum Association, Semiannual Meeting, Sheraton-Cleveland Hotel, Cleveland.

MAY, 1961

16-19 API Division of Marketing, Midyear Meeting, Americana Hotel, Miami Beach, Fla.

OCT. 29 - NOV. 1, 1961 NLGI Annual Meeting, Rice Hotel, Houston, Tex.

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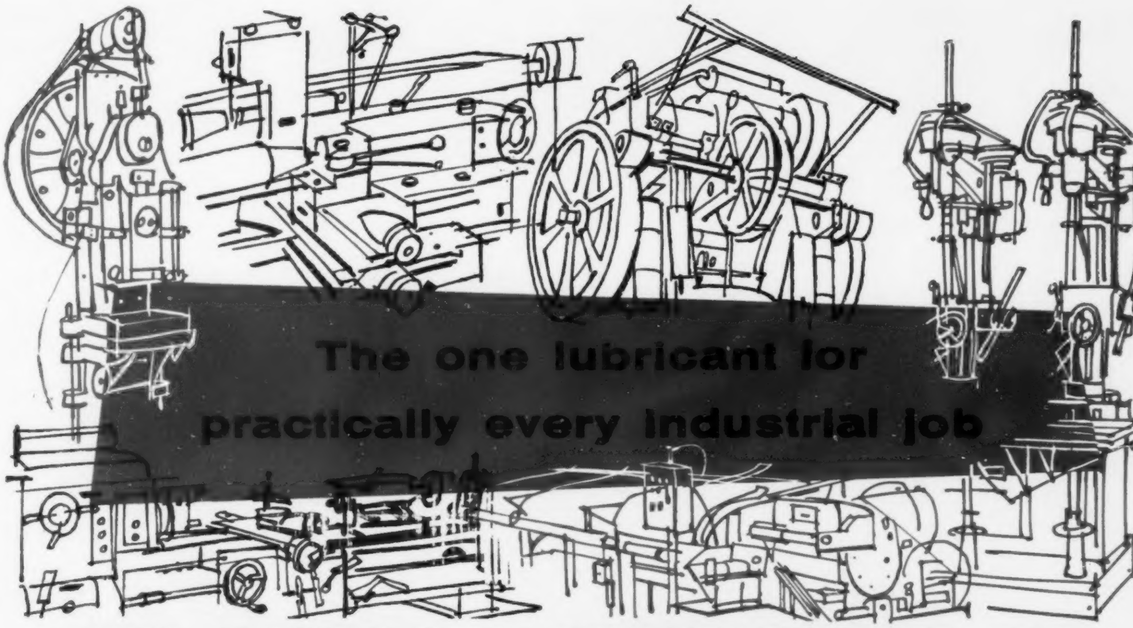

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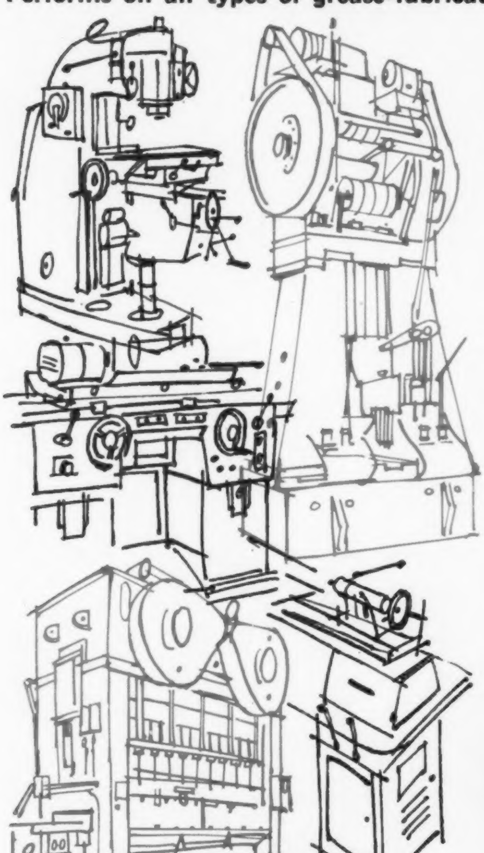

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The Challenge of the Sixties

By: C. J. Guzzo
Gulf Oil Corporation

IT IS A TRUE inspiration for me to come before you members of the National Lubricating Grease Institute. There's the personal delight of greeting many old friends. This is one of those rare pleasures that grows, rather than diminishes, with the years. And whether old friends or new, your presence here dramatizes for me one of the most unusual aspects of American business. Despite the keen individual competition among you men, through this Institute you have become fellow workers in advancing the grease industry. Your ability to extend your horizons beyond the dog-eat-dog concept of competition represents a distinguishing mark of the nation's successful modern enterprises.

I'm here in part to assure you the petroleum industry is well aware of the high standard set by the NLGI, as one of our member groups, for intelligent, far-sighted action. I bring you the industry's congratulations on a job very capably done, and I want to express our warm confidence in having you men as allies in the challenging times before us.

Because of that confidence, I also bring you a message that requires frank speaking. It might be out of place before a smug or complacent group; but I know I can rely on you to accept it in the friendly spirit in which it is offered. My message to you today is that the Grease Institute and its members, like all other petroleum societies, cannot rest on their record, no matter how illustrious. What grease people *have* done will not suffice for the future. The 1960's challenge all of us in petroleum to expend more brain-sweat and muscle-strain than ever before. Nothing else can buy our continuance as a real growth industry. Don't mistake me. You members of the Grease Institute can make this your finest, most profitable decade. I say you *can* do so. But in down-to-earth language, brothers, it ain't going to *just happen! The* gold in the sixties—and there will be plenty—must be truly earned.

Please do not think this is any sermon addressed to you from a safe coaching box on the sidelines. I've got to take my turn at bat and get on base, or it's back to the minors for me. The same story goes for everyone in petroleum; and the better everyone hits, the more sure our team of associated petroleum businesses will win its World Series. So in discussing the challenge of the sixties, I am not going to—in fact I cannot—talk about grease alone. Ours is a team play problem, with the good of one the good of all. Today I want to review what some other members of the petroleum team are doing, suggest how their actions will help you, and touch on the role you men can play to continue your victories and help the rest of the industry.

Now petroleum and grease, too, have always been growth industries in the past, and seem likely to continue so in the years just ahead. Nevertheless, any projected slowing up in our rate of increase brings us smack up against one long-overlooked truth. It's just this: Neither petroleum nor grease are *perpetual* growth industries by an Act of God. We've done a lot of riding on the coat-tails of national expansion in our

to the Grease Industry

Presented as the Keynote Address at the 28th Annual Meeting of NLGI, Chicago

history; from now on we're all going to have to do more running on our own two feet.

The handwriting is on the wall. In automotive products, compact cars are affecting gasoline consumption to a point where some analysts see the 1960 rate of gain as low as 2 per cent a year. The ratios of premium to regular gasoline and of motor oil to gasoline are both declining due to the manufacturers' designs and recommendations.

A similar fall in the ratio of grease to gasoline may be caused by pre-packed bearings and designs with fewer lubrication points. Ford Motor company's innovation of cars that allegedly "take care of themselves" may, in time, be followed to some degree by other car makers. The trend is being compounded by some manufacturers' extending car lubrication intervals to 2,000 miles. Makers are also setting gear lubricant drains at unreasonably long periods in the face of known deterioration of new improved gear lubricants at those intervals. Further, the tendency to require more special greases for such applications as universal joints, to name one, work against volume distribution and tend to shave profits.

In industrial markets, both lubricating oil and grease are hampered by the general slow-down of the economy. We have faith that this will soon be remedied since our economy has enduring strength.

These are the grim and somewhat formidable conditions we face. Certainly, they are grounds for taking the most energetic, the most aggressive and the most imaginative action of which we are capable. On the other hand, they are most definitely *not* grounds for panic or grounds for defeatism. In this country, which for so long has endowed its citizens with opportunities unrivaled in all other ages, if we believe in ourselves, we can reject any form of pessimism.

Let me illustrate with a true story related by one of our senior Pittsburgh executives, a story incidentally that bears on our industry. It occurred a little over 100 years ago, in the late 1850's, in a little town in New York state. The Pittsburgher's father, then a small boy, was halted one day by a bearded character who was well on in years. This local sage shook his head at the youngster pityingly, and pronounced in tones of doom:

"My boy, you'll live to see the day when everyone goes to bed by sundown. They'll be no oil to light the lamps—because they're killing off all the sperm whales."

That ancient New Yorker stands in my book for the trouble with pessimists both then and now. He was right about the sperm whales, but he was dead wrong about man's ability to solve such problems. Even as *he* was complaining, the *optimists* were reacting to the whale oil dearth by distilling coal and searching for mineral petroleum. In a year or so the discovery of crude oil produced a universal illuminant, soon thereafter replaced by its sister product, gas, and then again by electricity, each new light source better than the last. The cause for the old man's pessimism became a source of almost limitless riches to the optimist of his era.

That in a word gives my answer as to how, in our time, we can victoriously react to the contraction of familiar markets. The needs of society constantly change. It is up to us whether we are crushed by change, or seize its opportunities to become part of a different but greater future.

To review how some other segments of our petroleum industry are reacting to this challenge, let's start with motor oil. The importance of this product can be expressed in terms of its current gross annual revenue, which amounts to one and a quarter billion dollars at the retail level. If the previous motor oil ratio had been maintained, this figure would be substantially higher.

To both protect and increase present business, the lubrication committee of the American Petroleum Institute has been working with automobile manufacturers to bring to their attention the data developed by technical people in our industry. These data support our recommendation of an oil drain every 30 days in winter, every 60 days in summer, but never to exceed 2,000 miles.

The industry's findings have been largely concurred in by Chrysler Engineering which recommends for the 1961 models an oil change interval every 2,000 miles, or every two months, whichever occurs first. This is the same as last year when Chrysler came down from its former 5,000 miles' recommendation. General Motors generally recommends for its 1961 models an oil change based on a time interval of 30 to 60 days, depending on temperature and driving conditions, with a varying top mileage up to 4,000 miles, whichever comes first. Since few motorists put so much mileage on their cars in 30 to 60 days, the net effect is reasonably close to our recommendations.

We feel the industry's efforts have amply justified themselves in the cases of these major manufacturers.

The Ford Motor company's reaction has been less favorable. As you know, Ford has been advising customers to change oil every 4,000 miles. While this is disappointing, we hope that through extensive conferring we may have played a part in persuading Ford not to advance the mileage to even more extreme limits.

Our work in this field, which is continuing both on the research and the conference front, produces definite benefits to the grease industry. A large percentage of motorists follow the time-saving habit of ordering an oil-change and chassis-lubrication on the same trip to the service station. More frequent oil changes mean more chassis lubrication jobs and vice versa. I think, too, that our data and our work have influenced car engineers to consider the whole problem of car lubrication somewhat more basically, and that it may point the way to work which will help the grease industry.

A quite different effort at petroleum expansion is devoted to our fuel oil market, which has lacked aggressive attention for many years. Here a combined research and sales attack has been launched. The research phase centers on developing more reliable and economical home-heating oil burners, aimed at keeping heating oil fully competitive with other fuels. Since most major oil companies already were expending substantial sums on such projects and the values were becoming very clear, the API engaged the well-known Battelle Memorial Institute to recommend a fully coordinated research program for the industry. Meanwhile, additional research sponsored directly by the API itself will get under way next year. The scientists involved are enthusiastic, and as one example of how the undertaking breathes new life into the whole heating oil industry, a major manufacturer of oil heating equipment reversed previous plans to discontinue oil burner manufacturing, and added an engineering team to develop burners along unconventional lines suggested by the oil industry.

At the same time, a group of refiners formed the National Fuel Oil Council to actively boost sales. The Council levies assessments on heating oil sold by its members; and from these it matches sums raised by local home heating oil associations for promotion. Thus, Council funds double the advertising expenditures on a local level. Throughout heating oil territory, this support is helping to popularize oil heat and counteract the most competitive fuels.

Except in maintaining a healthy petroleum industry, the fuel oil program does not specifically affect you. Rather, I cite it as an effective blueprint of market development by the industry.

Your grease sales, on the other hand, should directly benefit from our major promotional effort, designed to increase gasoline consumption. Prior to this program, gasoline retailers had relied, justifiably, on the simple increase in auto ownership to enlarge our market for us. Today, however, the growing popularity of the low-gasoline-consuming car and the resistance to tax-inflated gasoline prices mean we can only accelerate gasoline sales by persuading motorists to do more driving. Such an accomplishment will, of course, proportionately increase the use of chassis lubricating greases.

A Travel Development Committee, with a staff underwritten by major oil companies, has been formed to rally not only gasoline marketers but all businesses benefiting from auto travel in a public campaign. Its theme is that our expanded roads, public parks, private recreational facilities and historical sites have transformed America today into a sightseers' wonderland. For people of every interest, sportsmen, scholars, artists, parents and travel-hungry children, a treasury of what each wants lies just down the road. And the

common denominator placing such pleasures within reach of all is that modern magic carpet—the motor car!

To sell this concept, our first move is toward securing more automobile travel news in newspapers and magazines. Already the Committee has received letters from well over 100 major newspapers promising support. Besides more daily news, the Committee will work to have all major papers carry each spring an automotive travel section. Further, an advertising committee will coordinate oil company advertising with the message, "Take to the Road for Fun." This committee will try to interest companies in spending less on fighting each other for the *same* gallon of gasoline and more on advertising that will create demand for *two* gallons in the place of one—as well as more trips to the grease rack.

A third project seeks to enlist in the "more driving" campaign, the $400 million annually spent in advertising by automotive, tire, hotel, resort, restaurant, state and other industries which benefit from motor travel. The Committee is also studying how to improve highway safety and combat the scare propaganda that keeps motorists off the highway. Ways to improve driver education and national control of licensing, and to achieve a strong but sane law enforcement are under review.

A special project seeks to attract the large auto rental companies into motor boat rentals to enlarge participation in that sport. Another will set up a program with international airlines to attract foreigners to see the U. S. by automobile—reversing the very successful propaganda about seeing Europe by car. Finally, we are working with the National Association of Travel Agencies to schedule national holidays on Mondays, so as to create more three-day week ends, which would stimulate motoring—and with it gasoline and grease sales.

In this Travel Development program, we pledge you our best efforts to enlarge the use of greases as well as of gasoline and oil. We urge your earnest support of the program. For, just as the petroleum industry intends that part of its efforts shall benefit grease, we look also to the initiative of the grease industry to advance the petroleum team. It is my sincere belief that either under programs conducted by the National Lubricating Grease Institute or executed by member companies with Institute guidance, you men can substantially improve your markets in the 1960's. Modern techniques of research, of market study, of mechanization, automation and other operational efficiencies, have placed in your hands the tools that can capitalize on the challenge of the 1960's.

How shall you use these tools? It would be presumptuous indeed for me to advise you grease experts. As a rank outsider to that rare combination of science and art that represents grease manufacture, I will only attempt some broad generalizations on what appear to me hopeful lines of action.

First of all, I would urge you: Don't surrender a dollar's worth of market without a fight. The practicality of the greaseless, self-service auto has yet to be proved in practice; and I don't propose that any of us in petroleum should accept it until it is established to the satisfaction of the car owner. We are all familiar with the importance of safety resulting from frequent inspection of items on cars brought in to stations for lubrication and oil change at reasonable intervals. Meanwhile, the grease industry has the opportunity to study the performance of the so-called "greaseless" cars compared with those serviced by your improved lubricants and report your findings to auto makers and public. Equally important will be your continued effort to improve automotive greases, simplify servicing methods and in every way seek to contribute to the attractiveness of your products.

Neither the petroleum retailer nor the grease industry can afford to relax promotion of the advantages of regular lubrication for safety, comfort and car maintenance. The benefits of lubricating every 1,000 miles need to be pressed by all concerned. I can assure you my own company, Gulf Oil, has not gone along with some car manufacturers' 2,000 mile recommendation but continues to strongly advise through its service stations the time-tested 1,000 mile chassis lubrication.

On all these fronts we still have time to collaborate in an effective fight for the automotive market. The vast number of cars on the road, dating from most 1961 models on back, will continue for many years to need conventional grease services. Let us make sure that our technologies of product quality and improved servicing take advantage of this period of grace to score competitive advances against the greaseless concept. None can tell now to whom science will award the victory. What we do know is that the automobile grease market represents far too important a business, both to the user and the seller, to lose by default.

Among your many other opportunities, farm and construction vehicles offer possibilities that are far from fully exploited. While manufacturers here, too, show some tendency to cut down on grease fittings, this is more than offset by the laxness of most operators in providing sufficient grease service. Educational programs, supported by hard selling on the basis of dollar-savings gained by proper lubrication of such vehicles, can lead to the establishment of larger markets. For these fields, an adaptation of an industry-wide, or industry-coordinated, marketing program appears worth considering.

Your record dramatizes how active you grease people have been on your most varied and continuous frontier, industrial equipment and machinery. Examples such as the lubricant for cotton picker spindles, which accounts for a large volume of grease that had no out-

let five years ago, could be repeated in varying degree over and over. None can really set a limit to the potentials for industrial grease, and it is nearly impossible to exhaust or even stay up to date with all profitable avenues of investigation. I can only urge an intensification of your efforts here, beyond perhaps what might be advisable under other market conditions. It seems to me the challenge of the 1960's requires us to exceed previous limits in seeking new industrial markets. Rewards can be large; and they will all be compounded—with the anticipated pick-up in industrial production.

The space age beckons both the grease and petroleum industry to lubricate new dimensions in transportation and eventually human travel. Who can doubt that grease can profitably solve many of these problems? Certainly you will wish to prepare for the possibility that volume grease markets may some day emerge from space requirements.

In internal operations, the 1960's challenge all of us to the often underestimated yet never finished task of improving our efficiency and economy. In times of expansion, we tend to think in terms of production at any cost; but depressed periods send us back to re-embrace the eternal values of cost control. For the grease industry likewise, economization and better efficiency can reverse financial downtrends and turn declining operations into profitable ones. I urge you to give this subject serious consideration on the basis of our experience in the general industry.

Obviously, by efficiency I do not mean penny-pinching for the installation of up-to-date equipment often represents the best savings as well as customer satisfaction. In this regard, I view the progress so many of you are making to modernize your packaging and shipping as one of the most valuable trends toward marketing maintenance and penetration. Protection of the product, speed of delivery and improved customer convenience in handling and application, all advance the industry competitively.

A final suggestion I make only because we need to remind ourselves of the obvious. It is that no effort will more greatly repay the grease industry than research. Your accomplishments have proved that: to mention only a few, your exceptional progress in developing new types of grease lubricants, the outstanding service properties built into modern greases, and your creation of lubricants that have kept pace with technological advances. But with science, the penetration of one frontier only opens up another. More research into the understanding of machine bearing needs may be helpful in opening up new markets; and there are scores of other valuable lines of inquiry awaiting.

How fortunate we are to be men of the present time with the very real magic of science at our service. No one pretends it is easy or sure. But its availability lifts from man the burden of having to *wait* for good fortune. It endows him with the almost godlike quality of being able to seek fortune along roads promising the quickest results. The extent to which grease people all call on this miraculous gift of science will largely determine—and without if's or but's—the kind of future you enjoy.

In conclusion, tremendous markets await the grease industry in the 1960's. These markets may not now be found alone on the highways, the farms, the factories, or railroad yards of our nation. In a large part these markets exist solely within the minds of you members of the National Lubricating Grease Institute, in your laboratories, and in the yet unexpressed needs of your customers. Through joint and individual action, guided by your Institute, you possess the opportunity to summon up those markets out of the realm of dreams into reality. In so doing you will only be repeating what grease and oil men again and again have done in the past.

You and I know in our hearts life is not meant for ease. We know our finest hours find expression in struggle and achievement. The 1960's challenge all of us in petroleum to such a supreme effort to overcome present trends. The decade challenges you grease men to make even more progressive this fine industry of yours. It challenges you to the most difficult task man can undertake—to reshape and enlarge your business scope and goals. If you meet these hard terms with the courage that built your wonderful grease record of today, then I have no doubt of the outcome. Then I know you will create—out of the challenge of the sixties—a greater and a more profitable future for grease than the nation has ever known. ■

About the Author

C. J. Guzzo *is a senior vice-president of Gulf Oil Corp. He has been with the Gulf organization continuously since* 1914 *when he was employed as a clerk in the company's bulk plant at Alexandria, La. He served as a company agent and as state manager for Tennessee, before being transferred to the New Orleans division office in* 1934 *as assistant division manager in charge of automotive sales. In* 1949 *he was promoted to general manager of the division. In* 1954 *he was elected vice-president in charge of domestic marketing. He has been a senior vice-president since June,* 1959. *A member of the American Petroleum Institute, he is vice-president of API marketing division.*

Lubricating Grease Requirements of the 1961 Cars

By: H. Eldridge

The Chek-Chart Corporation

Presented at the NLGI 28th annual meeting in Chicago, October, 1960

FROM THE standpoint of lubrication, there is much in the 1961 cars that is new and different. The 1960 model year, which introduced four new U. S. made compact cars, has often been called "the year of revolution." The 1961 model year might well be called "the year of evolution," since the large cars are now becoming shorter and are boasting of less horsepower, while the smaller cars are becoming larger and are boasting of more horsepower.

In addition to these changes in size and power, different methods of lubrication are appearing for the first time in several popular cars, particularly in the field of chassis lubrication.

The Compact Group

Looking first at the much discussed and extremely popular U. S. made compacts, the number of makes has increased over 1960 by 66⅔ per cent with the introduction of the new 1961 models. In 1960 there were six: Corvair, Comet, Falcon, Lark, Rambler and Valiant. In 1961 there are ten, the four new ones being the Buick Special, the Dodge Lancer, the Oldsmobile F-85 and the Pontiac Tempest.

Estimates indicate the future demand for compact cars may range as high as 75 per cent of all new car registrations by 1963 (Figure 1). This is one of the brighter spots in the over-all picture for the future of chassis and related lubricants, since these compacts, de-

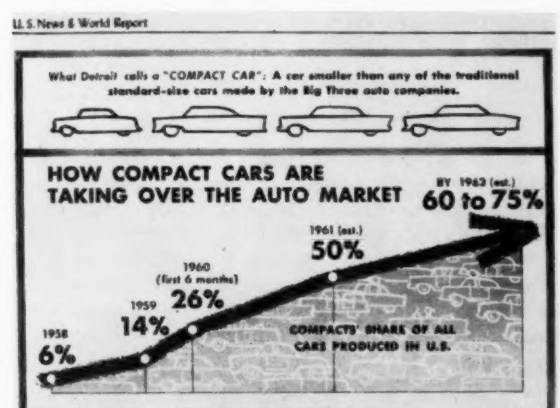

FIGURE 1. *(Courtesy, U. S. News & World Report).*

spite their smaller size, for 1961, at least, embody far less in the way of changes from a chassis lubrication standpoint than do their larger counterparts.

In reviewing the individual makes and commenting on the 1961 design changes, it should be understood that all product recommendations given in this paper are those of the respective car manufacturers.

American Motors

American Motors has introduced a new aluminum-block, valve-in-head, six-cylinder engine of 127 horsepower as standard equipment on the Rambler Classic.

The crankcase capacity is four quarts, and motor oil "For Service MS" is recommended rather than "For Service MM' which was recommended in 1960. The oil change interval is still 2,000 miles.

Chassis-wise, four fittings have been added, two at each of the lower trunnions on all models, making a total of either nine or eleven, depending upon the optional equipment selected. Chassis lubrication is recommended every 1,000 miles.

On all models, American Motors continues the use of prepacked, nylon-bushed bearings on the steering linkage points. No service is recommended at these points at any time. These units consist of a ball stud surrounded by a spring-loaded, tapered nylon bushing (Figure 2). They are factory filled with an NLGI No. 5 calcium soap rust inhibited grease, and are fully enclosed with a synthetic rubber seal at the top. They are typical of the units that are being used for the first time in 1961 on the larger or standard size cars. It is interesting to note that they are not greaseless, but are packed with grease at the time of assembly.

In the area of gear lubricants there is some change from 1960, with American Motors recommending that manual transmissions be lubricated with a straight mineral gear lubricant SAE 80 with SAE 20, 20W motor oil as the alternate. Automatic transmissions are to be serviced with automatic transmission fluid, Type A, Suffix A. Differentials require a multi-purpose lubricant SAE 90. Recommended drain intervals are still 10,000 miles for the manual transmission, 15,000 miles for the automatic transmission, with no lubricant change specified for the differential.

Chrysler

Chrysler has introduced the Lancer, a new car being marketed by the Dodge Division. It has a 106½-inch wheelbase and a six-cylinder, 101-horsepower engine, or as an option, a 145-horsepower engine, both of which have a four-quart capacity crankcase. Motor oil "For Service MS" is recommended with changes every 2,000 miles.

The Lancer has a total of ten chassis fittings on manual transmission models, and chassis lubrication is recommended every 2,000 miles. No prepacked steering linkage bearings or ball joints are used.

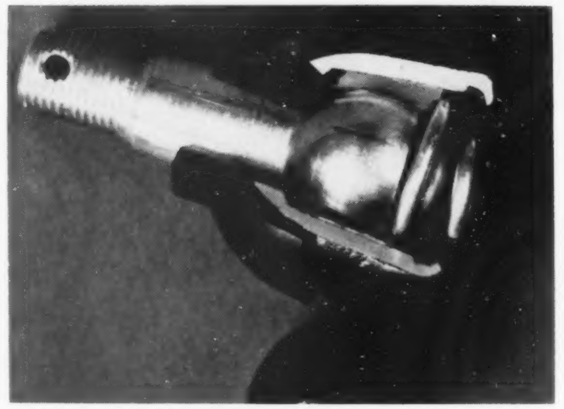

FIGURE 2—Rambler prepacked bearing (*Courtesy, Thompson Products*).

For the manual transmission the recommended product is multipurpose-type gear lubricant, API Service GL4, SAE 80, or automatic transmission fluid, Type A, Suffix A. The automatic transmission requires automatic transmission fluid, Type A, Suffix A. A multipurpose-type gear lubricant, API Service GL4, SAE 90 is recommended for the differential. Drain intervals are 10,000 miles for the automatic transmission and 20,000 miles for both the manual transmission and the differential.

The Plymouth Valiant, Chrysler's original compact, remains basically unchanged from the 1960 model as far as lubrication is concerned, and has exactly the same requirements as the Lancer.

Ford

Moving along to the Ford family, both the Comet and Falcon, which were introduced in 1960, continue unchanged. Each has a 3½-quart capacity crankcase in which motor oil "For Service MS" is recommended with a 4,000 mile oil change. Multi-viscosity oils may also be used if they meet the car manufacturer's test sequences.

The new 170-cubic inch, 101-horsepower engine introduced as an option for 1961 also has a 3½-quart crankcase capacity and the same motor oil recommendations.

There are still thirteen fittings on the chassis on manual transmission models with lubrication recommended every 1,000 miles. No prepacked steering linkage bearings or ball joints are used.

In the gear lubricant area, Ford calls for an SCL type lubricant meeting Ford Specifications M2C34-A, SAE 90 and M2C42, SAE 80 or equivalent. The manual transmission takes the SAE 80 grade the year around, and the differential requires SAE 90 above −25° and SAE 80 below that temperature. Suffix A transmission fluid (Ford Specification M2C33-B) is required for the automatic transmission. No drain interval is recommended for any of these three units,

which represents a change for 1961, since in 1960 Ford recommended draining and refilling of the automatic transmission at 24,000 miles.

General Motors

A new car this year is the Buick Special. It has a 112-inch wheelbase with a V-8 aluminum-block engine of 155-horsepower. For the four-quart capacity crankcase, a motor oil "For Service MS or DG" is recommended with drain intervals every 2,000-3,000 miles. Eighteen fittings are used on the chassis which should be lubricated every 1,000 miles. No prepacked steering linkage bearings or ball joints are used.

Every 10,000 miles a plug on the front universal joint spline must be removed, a fitting inserted and a multi-purpose extreme pressure chassis lubricant of No. 1 consistency applied through the fitting. The fitting must then be removed and the plug replaced.

For the manual transmission, either a straight mineral gear lubricant SAE 90 or a nondetergent SAE 40 or 50 motor oil is specified with no drain recommended. The automatic transmission requires automatic transmission fluid Type A, Suffix A, with draining and refilling at 25,000 miles. For the differential, a multi-purpose gear lubricant SAE 90 which meets Specification MIL-L-2105B is recommended with no drain.

The Corvair made by the Chevrolet Division is not greatly changed from 1960. It is still the only American-made rear engine car. The crankcase capacity is still four quarts and motor oil "For Service MS or DG" is recommended with drains at 4,000 miles.

The chassis continues with nine fittings which are to be lubricated every 1,000 miles.

A multi-purpose gear lubricant SAE 80 is recommended for manual transmissions, and automatic transmission fluid Type A, Suffix A is recommended for the automatic transmission with no drains. Differentials are lubricated with multi-purpose gear lubricant SAE 80. Drain interval is 10,000 miles.

Another newcomer for 1961 is the Oldsmobile F-85 which in many respects is similar to the Buick Special. The crankcase capacity is four quarts and a motor oil "For Service MS or DG" is recommended. However, the crankcase drain interval differs from Buick in that Oldsmobile recommends an interval of 3,000 miles or every three months, whichever occurs first, above +32° and 3,000 miles or every two months below +32°.

Like the Buick Special, the Oldsmobile F-85 has eighteen fittings and no prepacked steering linkage bearings or ball joints. Chassis lubrication is recommended every 2,000 miles.

There is also slightly different thinking on gear lubricants since Oldsmobile recommends a multi-purpose gear lubricant SAE 80 for the manual transmission and a multi-purpose gear lubricant SAE 90 for the differential with no drains. Automatic transmission fluid, Type A, Suffix A is recommended for the automatic transmission with drains at 26,000 miles.

General Motors' most changed newcomer is the 1961 Pontiac Tempest which has a 112-inch wheelbase and a four-cylinder engine of 110- to 155-horsepower depending on compression ratio, carburetion and transmission. This is the first four-cylinder engine which has been introduced since the "Henry J" in 1951. It has a four-quart capacity crankcase using motor oil "For Service MS or DG" with change recommended every 60 days above +32° and every 30 days below +32°, but never to exceed 4,000 miles. The Tempest also offers an optional V-8 engine rated at 155-horsepower which has the same crankcase capacity and motor oil reommendations as the four-cylinder engine.

The chassis has eleven fittings on models without power steering and twelve fittings where power steering is specified. Chassis lubrication is recommended every 2,000 miles. No prepacked steering linkage bearings or ball joints are used.

For the new Transaxle, multi-purpose gear lubricant SAE 80 or 90 is recommended for both the manual transmission and the differential. Draining of these units is not recommended. For the automatic transmission, automatic transmission fluid, Type A, Suffix A is used but no drain is specified. The automatic transmission fluid is sealed from the differential; however, the manual transmission lubricant flows between the two housings.

Studebaker

Studebaker Lark offers a new engine in the 1961 model. It is an overhead valve six-cylinder job developing 112-horsepower. This engine has a five-quart capacity crankcase and calls for motor oil "For Service MS" with changes every 2,500 to 3,000 miles.

The chassis has nineteen fittings as compared with the twenty used in 1960. A fitting was dropped due to the introduction of suspension pedals which use nylon bushings. No prepacked steering linkage bearings or ball joints are used. Chassis lubrication is recommended every 1,000 miles.

For the manual transmission, Studebaker recommends straight mineral gear lubricant SAE 80 or motor oil SAE 30, with drains at 10,000 miles. For the automatic transmission they recommend automatic transmission fluid, Type A, Suffix A, with drains at 15,000 miles. The automatic transmission is filled from under the hood on all 1961 Lark models instead of through the floor as it has been previously. For the differential a hypoid gear lubricant SAE 90 or a multi-purpose-type gear lubricant, API Service GL4, SAE 90 is required, with no drain.

It is apparent from the above that the entire 1961

compact group presents little that is new or different from a lubrication standpoint. Most of the radical changes are found in models of the larger cars.

The Standard Size Group

Chrysler

The entire 1961 Chrysler line of Chrysler, De Soto, Dodge, Imperial and Plymouth is unchanged from 1960 insofar as lubrication is concerned. All of them call for a motor oil "For Service MS" with a 2,000 mile change interval, and all continue the use of fittings for the front suspension and steering linkage.

The 1961 Chrysler New Yorker and 300G, as well as the Imperial, each have eight fittings. The Chrysler Newport, Windsor, De Soto, Dodge and Plymouth have eight to ten fittings, the additional fittings being found on the manual transmission models only. For all of these cars, chassis lubricant is recommended every 2,000 miles.

Throughout the group, Chrysler calls for a multi-purpose-type gear lubricant, API Service GL4, SAE 90 in the differential above −10°, with drains at 20,000 miles. Automatic transmission fluid, Type A, Suffix A is recommended for the automatic transmission with drains at 10,000 miles. In the manual transmission, multi-purpose-type gear lubricant, API Service GL4, SAE 80 is specified for above −10°, with automatic transmission fluid, Type A, Suffix A recommended as an alternate with drains at 20,000 miles.

Ford

The most important changes affecting lubrication are found in the 1961 Ford Group, consisting of Ford, Lincoln Continental, Mercury and Thunderbird.

Ford itself continues with optional six- or eight-cylinder engines with the same crankcase capacity and requirements as in 1960, although the engines have been changed. The oil change interval remains at 4,000 miles.

On the chassis, however, *all* fittings have been removed. There were twelve in 1960 on manual transmission models with standard steering. In 1961, nine prepacked bearings are used on the steering linkage and ball joints. These prepacked bearings are equipped with threaded steel plugs (Figure 3). These plugs must be removed and the bearings relubricated every 30,000 miles with a Ford Specification No. M-1C47 Grease, having a lithium base with molybdenum disulphide added and of NLGI No. 2 consistency, A special adapter is required to lubricate through the plug holes. This is a completely new type adapter which is a *must* for everyone lubricating 1961 Ford Motor Co. cars.

The 1961 Ford also has a plug on the front and rear universal joints. These plugs must be removed every 30,000 miles and the joints lubricated with universal joint lubricant.

Ford recommends an SCL type lubricant conform-

FIGURE 3—Ford prepacked bearing—threaded steel plug.

ing to Specifications No. M2C42, SAE 80 for the manual transmission and No. M2C34-A, SAE 90 for the differential above −25°. The automatic transmission calls for automatic transmission fluid, Type A, Suffix A meeting Ford Specification No. M2C33-B. None of the three units is to be drained and refilled.

The 1961 Mercury is similar to the new Ford in many respects. The engine is either a six- or eight-cylinder engine which requires a motor oil "For Service MS." Multi-viscosity oils which meet manufacturer's test sequences may be used. The oil change interval remains at 4,000 miles or every four months.

The fourteen fittings which appeared on 1960 models have been eliminated and, due to new design, nine prepacked bearings are used, which call for lubrication service every 30,000 miles. However, here the plugs must be removed, a fitting or a special adapter inserted, the moly type lubricant applied, the fitting or adapter removed and the plug reinserted.

Like the Ford, the Mercury also has plugs at the front and rear universal joints which must be lubricated every 30,000 miles with universal joint lubricant.

All gear lubricant recommendations are identical with those of the 1961 Ford.

One notable change in the case of the 1961 Lincoln Continental is a new oil change interval of 6,000 miles or six months, as compared with 4,000 miles or every four months in 1960. Lincoln Continental still specifies motor oil "For Service MS" with the usual Ford proviso on a multi-viscosity oil.

There is a radical change in the number of fittings. These have been reduced from thirteen in 1960 to four in 1961. The four fittings retained are on the universal joints. There are eleven prepacked bearings (with threaded steel plugs) on the front suspension and steering linkage which must be lubricated every 30,000 miles. The four front suspension ball joints are to be

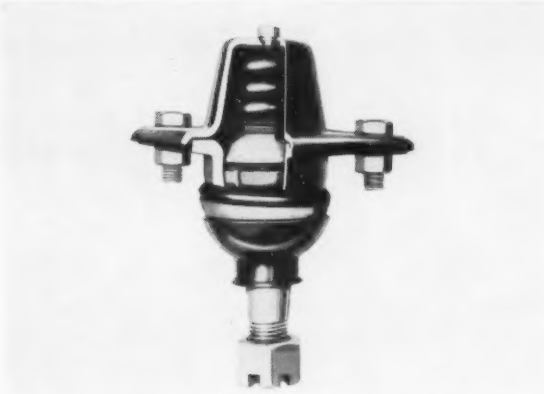

FIGURE 4—Lincoln Continental suspension ball joint.

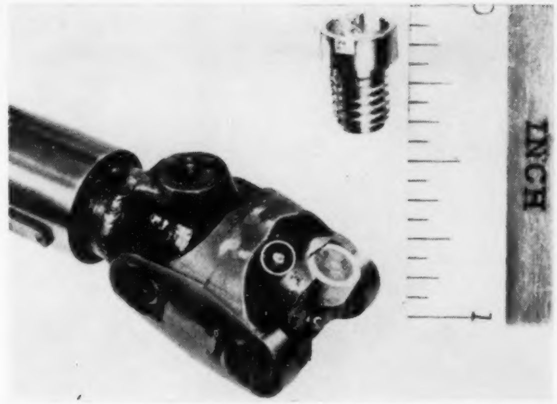

FIGURE 6—Lincoln Continental universal joint flush type fitting.

lubricated through a special adapter with a No. 2 moly type lubricant, Ford Specification No. M-1C47 (Figure 4). The steering linkage joints are to be lubricated with a product meeting Ford Specification No. M-1C48, which calls for a calcium base cup grease of No. 5 consistency. A double Cardan constant velocity joint with a centering ball is new for 1961 (Figure 5). Both

FIGURE 5—Lincoln Continental universal joint.

the Cardan joint and the conventional cross-type universal joint at the rear of the drive shaft have regular hydraulic fittings, but the centering ball has a new flush-type concave fitting which is extremely small and will be hard to find, particularly when the joint is covered with dirt (Figure 6). The only way this fitting can be lubricated is with another special adapter. Chassis lubricant is recommended at all four universal joint fittings every 6,000 miles.

The differential requires a multi-purpose gear lubricant meeting Ford Specification No. M2C16-B, and no drain is recommended. The 1961 automatic transmission requires automatic transmission fluid, Type A, Suffix A, meeting Ford Specification No. M2C33-B, with no drain, as compared with a 24,000 mile drain period in 1960.

Continuing with 1961 Ford-made cars: Despite the design changes made in the Thunderbird, its lubrication requirements have changed very slightly from 1960 models. The crankcase specifications remain the same and the drain interval stays at 4,000 miles.

The number of fittings has been reduced from fifteen to twelve, due primarily to a newly-designed suspension system, and the chassis lubrication interval has been extended to 4,000 miles. Only two prepacked bearings are used, one at each end of the steering connecting linkage. These are without plugs, so no further service is required.

The 1961 Thunderbird has a plug in each universal joint which must be removed, a fitting inserted and universal joint lubricant applied every 6,000 miles, using a pressure relief adapter. When this has been done, the fitting can either be removed and the plug replaced or the fitting may be left in permanently if desired.

General Motors

The General Motors group shows several changes which are of interest.

The 1961 Buick retains its four-quart crankcase capacity and the recommendation of motor oil "For Service MS or DG" with changes at 2,000 to 3,000 miles.

When it comes to chassis lubrication, however, there are marked changes from 1960 models. For example, on cars with standard steering, Buick has dropped from eighteen fittings for the front suspension and steering linkage to nine. These nine fittings are located as follows: four on the upper control arms, four on the suspension ball joints and one on the steering linkage on models without power steering. Chassis lubrication is recommended every 1,000 miles. The nine fittings eliminated have been replaced by four rubber-mounted points and five prepacked bearings with threaded

FIGURE 7—Buick prepacked bearing—threaded plastic plug.

plastic plugs, which do not require any lubrication service (Figure 7).

Buick's new two-piece drive shaft utilizes four universal joints which are packed at assembly and require no further service. The two center joints are set close together to form a constant velocity joint and the centering ball on this is provided with a flush-type fitting (Figure 8) similar to, yet different from, that used on the 1961 Lincoln Continental. This again is a tiny fitting which will be hard to find and hard to reach, as the propeller shaft is mounted in the frame tunnel and it is necessary to align the fitting with the access hole shown. An NLGI No. 1 multi-purpose EP chassis lubricant should be applied to this fitting every 5,000 miles, through a special adapter.

Every 10,000 miles the spline should be lubricated with the same lubricant, through the same adapter.

For the automatic transmission, Buick recommends automatic transmission fluid, Type A, Suffix A, with drains at 25,000 miles. For the differential, Buick recommends a multi-purpose gear lubricant SAE 90 meeting Specification MIL-L-2105B, with no drain period.

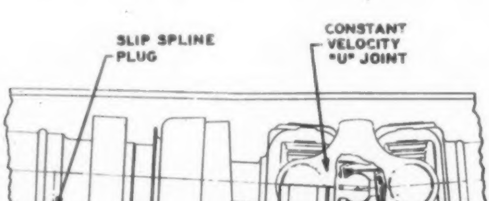

FIGURE 8—Buick centering ball U joint flush type fitting.

The 1961 Cadillac is the most radically changed car in the General Motors line, from a lubrication standpoint.

The crankcase capacity has been reduced from five to four quarts. The motor oil recommendation is "For Service MS" with changes recommended every 4,000 miles or every 60 days above +32° and every 30 days below +32°.

On the chassis, of the eighteen fittings which appeared on the 1960 cars, two have been eliminated through redesign; six have been replaced with rubber-mounted points, these being the upper and lower control arm inner end bearings; two have been replaced by nylon bushings, these being the steering idler arm pivot and the parking brake bell crank; and the eight steering linkage and suspension ball joint fittings have been replaced by prepacked bearings. These prepacked bearings are all equipped with unthreaded plastic plugs (Figure 9). Cadillac recommends that at each oil change, or every 4,000 miles, the seals be checked for condition and the plugs checked to be sure they are in place. If the seal is damaged, it should be replaced, the bearing relubricated and a new plug installed. Every 30,000 miles the bearings must be checked, inspected and relubricated through the plug holes and a new plug inserted.

FIGURE 9—Cadillac prepacked bearing—unthreaded plastic plug.

For the lubrication of the front suspension ball joints, Cadillac recommends the use of a special hand gun (Figure 10) to apply a special front suspension ball joint lubricant meeting GM Specification No. 4751-M which will be sold through their parts and accessories department. Both the gun and the lubricant container will be identified with a red band.

For lubrication of the steering linkage points, Cadillac will market another special lubricant in a blue-banded can. A separate lubrication gun with a match-

FIGURE 10—Cadillac ball joint—gun red.

ing blue band (Figure 11) will be required for lubrication of these prepacked points. This lubricant is the same as that used for initial packing and can generally be described as an NLGI No. 5 calcium soap rust inhibited grease. If a dealer does not have either of these special guns, he can, of course, lubricate both groups of points using a special adapter.

FIGURE 11—Cadillac steering linkage—gun blue.

The automatic transmission, which is standard equipment, requires automatic transmission fluid, Type A, Suffix A, with an initial change at 30,000 miles and subsequent changes at 16,000 miles, which is a departure from the 12,000 mile recommendation in effect in 1960. For the differential, a multi-purpose gear lubricant SAE 90 is recommended above 0° and SAE 80 below 0°. This is to be changed only for temperature requirements, as a regular drain interval is not recommended.

The 1961 Chevrolet is basically unchanged from 1960 models, continuing with optional six- or eight-cylinder engines and an oil change interval of 4,000 miles.

Chevrolet continues to use a maximum of eleven chassis fittings on models with manual transmission and power steering, the same as in 1960, with a chassis lubrication interval of 1,000 miles.

For the manual transmission and for the differential, Chevrolet recommends a multi-purpose gear lubricant SAE 90 with no change for the transmission, and 10,000 miles or once a year change for the differential. Automatic transmission fluid, Type A, Suffix A, is recommended for the automatic transmission with no drain.

The 1961 Oldsmobile is radically changed from 1960 production although the crankcase capacity continues at four quarts and motor oil "For Service MS or DG" is still recommended. The new change interval is every 3,000 miles or every three months for temperatures above +32° and every 3,000 miles or two months below +32°, whichever occurs first, as compared with 4,000 miles in 1960.

On the chassis only four fittings (those on the ball joints) are left, as compared with seventeen in 1960. The chassis lubrication interval is still 2,000 miles. Six fittings have been eliminated through redesign of the suspension control arms. Seven of the new prepacked bearings are used but these do not have plugs and require no field service. Some of these units are again different in that they have a one-piece Delrin bushing and ball seat (Figure 12).

On the automatic transmission models, the front universal joint spline has a plug which must be removed every 8,000 miles. A fitting should then be installed and the spline lubricated with Oldsmobile special spline lubricant Part No. 567196, which is a lithium base product of NLGI No. 2 consistency, containing Teflon; the fitting should then be removed and the plug replaced.

On the manual-shift transmission model, Oldsmobile recommends a multi-purpose gear lubricant SAE 80, and for the differential, SAE 90 for make-up only. A special multi-purpose gear lubricant, Part No. 531536, is to be used for refilling the differential at the time of overhaul. No drain is recommended for either manual transmission or differential, but draining at 26,000 miles

FIGURE 12—Oldsmobile prepacked bearing, Delrin bushing.

is specified for the automatic transmission where automatic transmission fluid, Type A, Suffix A is recommended.

Pontiac has made relatively few lubrication changes for 1961. The V-8 engine crankcase capacity has been reduced to four quarts, and requires a motor oil "For Service MS or DG" with changes at 60 days above $+32°$, and at 30 days below $+32°$, but never to exceed 4,000 miles.

On the chassis the number of fittings has been reduced from seventeen to fifteen and lubrication is required every 2,000 miles. No prepacked bearings are used.

For the manual transmission, Pontiac recommends a multi-purpose gear lubricant SAE 80; for the automatic transmission, automatic transmission fluid, Type A, Suffix A; and for the differential, a special multi-purpose gear lubricant, Part No. 531536. No drain is recommended for manual transmission or differential, but the automatic transmission is to be drained and refilled every 25,000 miles.

If you are now somewhat confused by this mass of data, let's brief it down to this:

Insofar as chassis lubrication is concerned:

1. All compacts, all Chrysler cars, Chevrolet and Pontiac are continuing the use of fittings.
2. Buick and Oldsmobile are continuing with a reduced number of fittings but are also using prepacked bearings, which require no lubrication; on steering linkage points.
3. Cadillac is using prepacked bearings entirely, with inspections at 4,000 miles and lubrication at 30,000 miles. Cadillac recommends one lubricant for ball joints and another for steering linkage points.
4. Lincoln Continental is using prepacked bearings with lubrication required at 30,000 miles and, like Cadillac, recommends one lubricant for ball joints and another for steering linkage points.
5. Ford and Mercury are using prepacked bearings with lubrication required at 30,000 miles, but recommend only one product for both ball joints and steering linkage points.

Furthermore, all the manufacturers mentioned qualify the average drain intervals for the crankcase by making exceptions for stop-and-go driving, dusty conditions, et cetera.

The Imports

One of the most interesting imports in 1961 is the new British Triumph Herald. You have undoubtedly seen its advertising in which they are featuring the almost complete lack of lubrication requirements (Figure 13).

FIGURE 13—Triumph Herald ad.

In general, this is a small-size car with a 91½-inch wheel-base and a four-cylinder engine with an 8½ to 1 compression ratio.

The small engine has a 2.2 quart capacity crankcase and calls for motor oil "For Service MM or MS" with changes at 3,000 miles.

In the front suspension, there are six nylastic bushings and four bonded rubber bushings requiring no lubrication service. The two tie rod ends and the two upper suspension ball joints are packed with a lithium base grease and require no further service.

On the two steering lower trunnions (one each side), every 6,000 miles the plug should be removed, a fitting inserted and an SAE 90 hypoid gear lubricant applied through a hand gun. The fitting should then be removed and the plug replaced.

The steering gear requires lubrication with a lithium base chassis lubricant every 12,000 miles as do the wheel bearings.

Another import which is more conventional in its lubrication requirements, but still new and different is the small 1961 Austin 850/Morris 850 which was recently introduced into this country. This car has an 80-inch wheelbase, yet it seats four people. Probably the most interesting thing about it is that the engine (Figure 14), transmission and differential are all made in one unit which is mounted transversely at the front of the car. It is, of course, a front-wheel-drive vehicle and all four wheels are independently suspended using a new system of rubber cones and telescoping shock absorbers.

The combined capacity of the transmission, differential and crankcase is 5.4 quarts and motor oil "For Service ML, MM or MS," SAE 30 is recommended for temperatures above $+32°$ with a change recommended every 3,000 miles.

There are twelve chassis fittings which require lubrication every 1,000 miles.

The rear wheel bearings are to be lubricated every

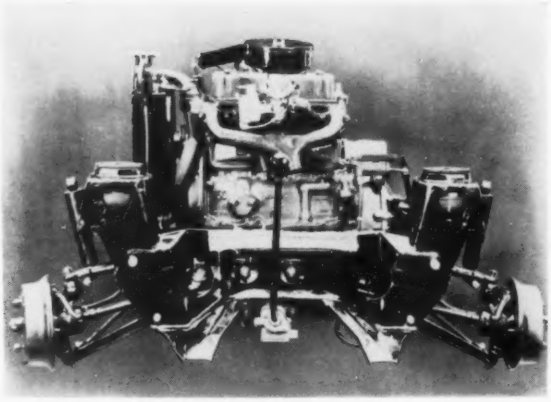

FIGURE 14—Austin 850/Morris 850 engine.

6,000 miles with a lithium base grease by filling the hub cap and replacing it. The front wheel bearings are packed at assembly and require no further service.

Imported cars still offer you a sizeable market since there are approximately 1,750,000 of them in use. The twenty-four most popular makes average:

18 fittings each
3-¾ quart crankcase capacity
3-½ pint transmission capacity
2-½ pint differential capacity
a chassis lubrication interval of 1,235 miles.

As a rule, the owners of these cars are very particular about the way their cars are serviced, and in many cases these owners drive larger cars as well. While the imports may be small in size, they are good consumers of your products.

Summary

To summarize, some of the 1961 lubricant recommendations are similar to those specified in 1960, particularly wheel bearing repacking or inspection which is recommended by most manufacturers every 10,000 miles. The exceptions are Cadillac at 30,000 miles, Ford at 12,000, Lincoln Continental at 24,000 and Pontiac who recommends repacking wheel bearings, only when the wheels are removed for some other purpose.

One interesting point is that, despite much advance publicity, none of the new prepacked bearings used on steering linkage points or ball joints are of the Teflon type which were expected to come into general use. All are of either the Nylon or Delrin bushing prepacked type, requiring a grease.

Despite all the doom and gloom prophesied for the automotive lubricant market, it appears from the above that if the compact cars, which are increasing in number by leaps and bounds, continue with their use of fittings, the over-all picture may be somewhat better than originally anticipated. Although today they represent a small part of total registrations, percentagewise, this total will grow rapidly in the next five years.

It should also be borne in mind that when, as and if the day ever arrives when all fittings are eliminated from all cars, there are still a great many things that must be done at regular and frequent intervals to keep the modern automobile performing satisfactorily and running safely. These services can be performed most conveniently in the lubrication bay of the average service station, so there is more than ample justification for the car owner to continue his regular monthly visit to the dealer for safety inspection and lubrication service.

It is suggested, therefore, that you plan now, if you have not already done so, to promote an over-all program consisting of a combination of safety inspection, lubrication and systematic preventive maintenance, as a means of:

First—Protecting the safety of your best customer, Mr. and Mrs. Motorist and their family.

Second—Safeguarding the major investment which they have made in today's fine automobiles.

Third—Maintaining the petroleum retailers' monthly inspection of their customers' cars, which will produce the following benefits for the dealer:

a. More chassis lubrication business
b. Increased oil sales
c. Increased sales of TBA and other products and services—including gasoline.

The old slogan "Lubricate for Safety Every 1,000 Miles" means more today than it ever has in the past, and can mean much more in the future—*if*—it is really *sold* to the motoring public.

About the Author

H. Eldridge *received a BA degree from Yale university in* 1928. *He was associated with the Alemite Div., Stewart-Warner Corp. from* 1928 *to* 1932, *and with The Chek-Chart Corp. from* 1932 *to* 1941. *He spent four years in the Army Air Force, serving overseas as an intelligence officer. In* 1946, *he returned to Stewart-Warner where he remained until* 1957 *when he joined Chek-Chart as executive vice-president. He became president on the death of Ray Shaw. Mr. Eldridge is a member of API.*

Infrared Studies of Greases

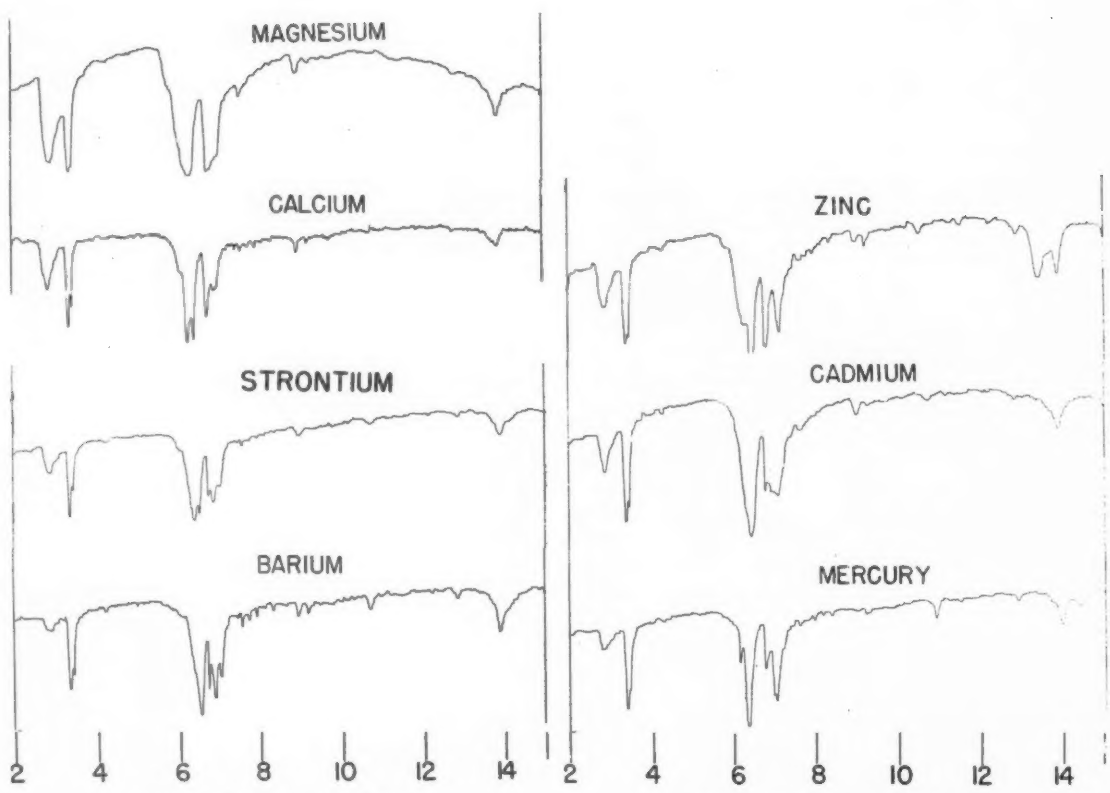

FIGURE 1—Infrared spectra of various metallic laurate soaps.

By: S. E. Wiberley and W. H. Bauer
Rensselaer Polytechnic Institute
and D. B. Cox
Socony Mobil Oil Company, Inc.

An original paper offered to the National Lubricating Grease Institute

Abstract

Studies of infrared absorption of greases were shown to yield valuable information concerning the grease thickeners and additives used in grease formulation. Results of the study of a series of metallic laurate soaps were applied to the examination of the infrared absorption spectra of an aluminum soap grease, a calcium complex grease, a lime base grease, a lithium soap grease and a soda base grease. Infrared spectra revealed structural changes in the processing of calcium acetate complex greases.

Introduction

Infrared spectroscopy is an important physicochemical method for the study of greases. From the infrared spectrum of a grease, it is possible to identify the type of grease thickener and in certain cases the additives involved in the grease formulation. Grease processing operations can also be followed by observing changes in the infrared spectra of grease samples taken at appropriate intervals.

This paper is not intended to be an exhaustive survey or to present a large catalog of spectra of materials involved in grease manufacture. The major purpose is to indicate the areas of grease technology where infrared absorption measurements may yield valuable information.

The first infrared absorption studies on hydrocarbon thickeners were carried out at Rensselaer Polytechnic Institute on aluminum soaps[1,2] and the mechanism of peptization of these soaps in hydrocarbon gels was explained with the aid of infrared measurements.[3] In 1955 Robert and Favre[4] reported the infrared spectra of various metallic soaps in mineral oil. These authors showed that the carbonyl group in the metallic soap

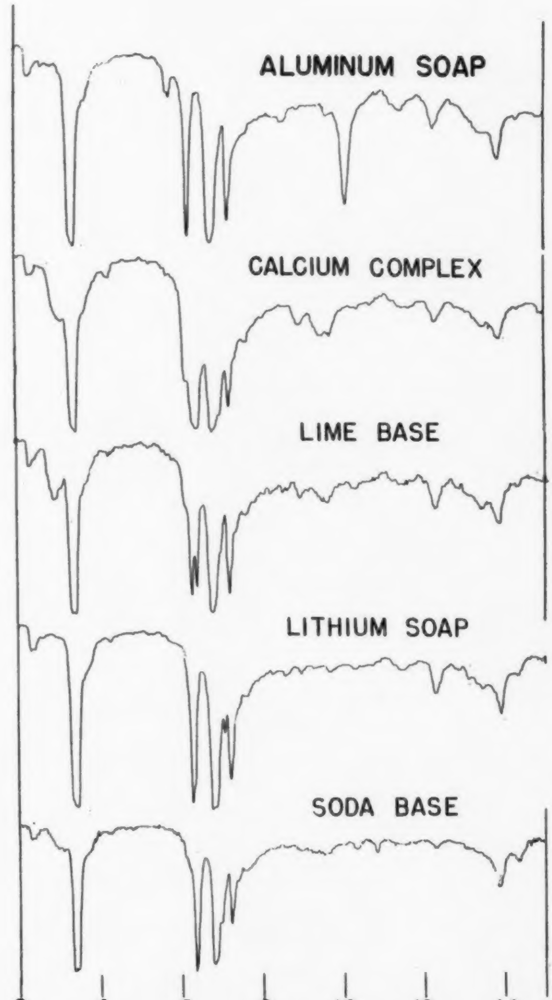

FIGURE 2—Infrared spectra of different commercial greases.

shifted to longer wave lengths as the atomic weight of the metal increased. The following year Damerell and Milberger[5] investigated the application of infrared spectroscopy to grease structure studies of bentone greases. These same authors in conjunction with Miller[6] subsequently carried out infrared studies of bentone grease water systems. Ronan and McLaren have demonstrated how infrared measurements were valuable in identifying deposits suspected to be caused by either a soluble oil or a grease.[7]

Experimental

The infrared absorption measurements were made with a Perkin-Elmer Model 21 Recording Spectrophotometer. In most cases the greases were measured as thin capillary films between two rock salt crystals, although on occasion samples 0.025 mm. thick were studied to emphasize the weaker bands. Spectra of solids were obtained by grinding in a Wig-L-Bug approximately 1 milligram of the solid with 150 milligrams of Harshaw potassium bromide of infrared quality. The resulting mixture was pressed under high pressure in a vacuum die into a transparent disc. The disc was placed in a suitable holder and the spectrum was measured.

Metallic Laurate Spectra

In order to study the effect the metal group has on the infrared absorption spectra, a series of laurate soaps of magnesium, calcium, strontium, barium, zinc, cadmium and mercury were prepared by the usual aqueous precipitation method. The soap was precipitated from a stock sodium laurate solution by addition of a solution of the appropriate metal salt. Derivatives of lauric acid were chosen because of the previous experience in this laboratory with aluminum dilaurate soaps.

The melting points, temperature of precipitation, the atomic weights and the position of the C=O bands of these laurates are listed in Table I.

TABLE I

Physical Properties of Metallic Laurate Soaps

Element	*Atomic Weight*	*Temperature of Precipitation, °C*	*Melting Point, °C*	*C=O Band, Microns*
Mg	24.32	50-54	139-142	6.37
Ca	40.08	58-73	150-172	6.31, 6.47
Zn	65.38	49-55	128-129	6.45
Sr	87.63	51-59	211-213	6.45, 6.57
Cd	112.41	35-39	98-99	6.45
Ba	137.36	60-74	>230	6.59
Hg	200.61	27-29	119	6.48

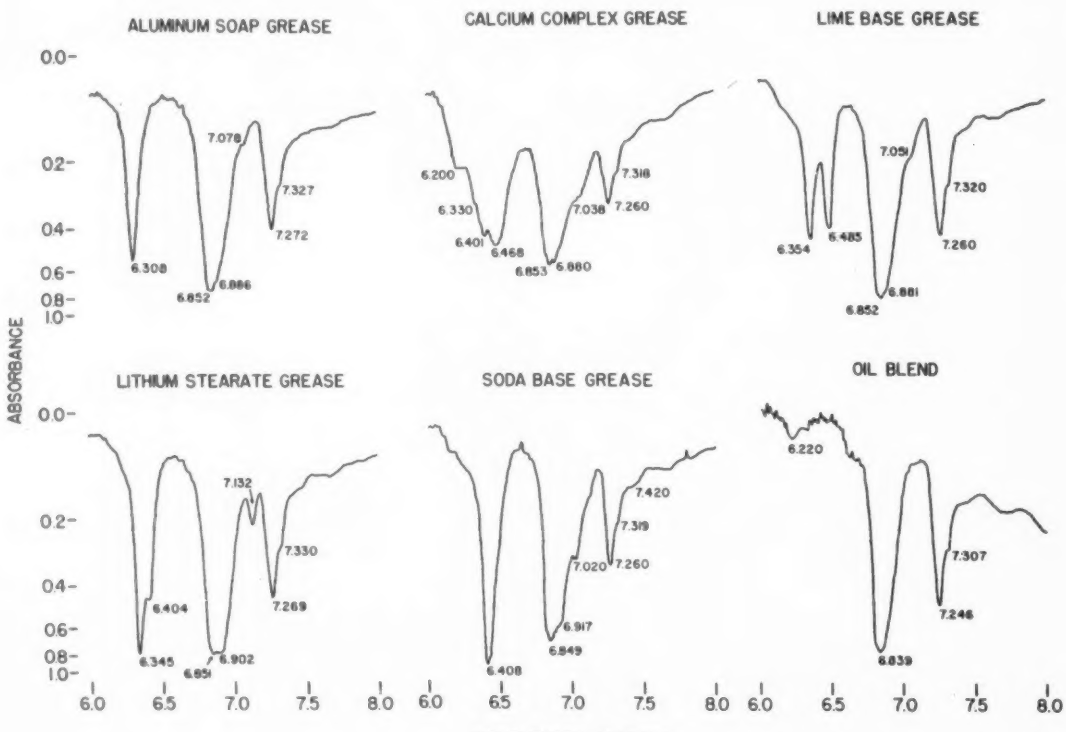

FIGURE 3—Infrared spectra of commercial greases and a typical oil blend in the 6 to 8 micron region.

The temperature of precipitation is given because it has been found to be an important variable in the preparation of similar soaps of aluminum. The spectra of these metallic soaps are shown in Figure 1. Distinct differences can be seen in the C=O region. Although there is an increase in the C=O band toward longer wave lengths as the atomic weight increases (provided one selects the proper band of the doublet) in the case of the alkaline earths, the position of this band is the same for zinc and cadmium and only slightly shifted for mercury.

Typical Grease Spectra

The spectra of five commercial greases, an aluminum soap grease, a calcium complex grease, a lime base grease, a lithium soap grease and a soda base grease, were obtained. These spectra, shown in Figure 2, have many interesting features. The aluminum soap grease is by far the most distinctive having a strong sharp band at 10 microns. This band has been assigned to an Al-O stretching vibration[2,8] and is usually split into a distinct doublet when the aluminum soaps are prepared from branched chain fatty acids.

All of the greases have a very distinctive pattern in the 6 to 8 micron region. In order to study this difference, high resolution spectra were obtained in this wave length with a calcium fluoride prism. These spectra shown in Figure 3 offer additional evidence as to the distinctive features of the C=O groups. It can be seen, therefore, that characterization of grease types can be readily made by comparison with the known spectra shown in Figure 2.

In order to compare the spectra of the thickeners with the thickener in the grease formulation, the spectra of three soaps prepared by aqueous precipitation methods were obtained using the potassium bromide technique described in the Experimental Section. In Figure 4 the spectra of an aluminum soap, a calcium soap and a lithium soap all prepared from stearic acid, and, for comparison, the corresponding commercial greases are shown. It is evident that the distinctive bands in the grease in the 6 to 8 micron region can be attributed to the thickener. Also from this comparison the major oil bands in the grease can be assigned to the bands at 3.2 (C-H stretching), 7.4 (C-H deformation), 12.4 and 14.0 microns (C-H rocking). In general, these are the major bands observed in commercial oil stocks used in grease manufacture. It should be pointed out that it is possible to distinguish between different oil stocks by measuring the oil spectra separately.

It is also important to note that, with the exception of the aluminum grease, the metallic soaps were formed in situ in the petroleum oil. Thus, the infrared spectra reveal that the metallic soap formed in situ in the petroleum oil is identical to the same soap prepared in an aqueous precipitation process. Minor differences in the spectra occur if different fatty acids are involved in the two methods. However, as long as the fatty acids are similar, the spectra remain identical.

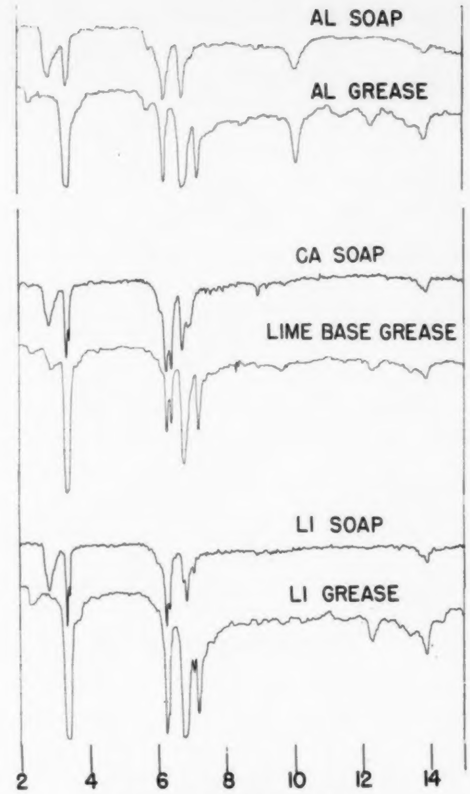

FIGURE 4—Infrared spectra of soaps and corresponding greases.

Specific Identification of Thickeners and Additives

In a preceding section, illustration was given of how different metals changed the infrared spectra of a series of soaps of the same acid. Then examples of five major grease types were given. In all these examples, the acid portion of the soap was a straight chain, unsubstituted fatty acid. Other substituted acids may contribute unique absorptions in the infrared region which serve to identify thickeners more closely. For example, a lithium 12-hydroxystearate grease yields the spectrum shown in Figure 5. Although the spectrum of this grease resembles that of the normal lithium grease, the hydroxyl band is quite distinctive. Similarly, calcium 12-hydroxystearate has a strong hydroxyl band. The spectrum of this soap in oil is different from that of the calcium acetate complex grease particularly in the 6 to 7 micron region. It more closely resembles the spectrum of the hydrated "cup" type lime base grease shown in Figure 2. However, the relative intensities of the two bands in the 6 to 7 micron region are different, again emphasizing the importance of the band pattern

in the carbonyl region for identification.

Infrared spectra will reveal the presence of certain additives and other minor components in greases. Many additives occur in very small amounts; so it is necessary that the additive not only have a group that absorbs in the infrared but that it absorb strongly enough to be distinct from background absorption. Furthermore, such absorption must be at a wave length different from strong bands contributed by the major components such as the thickener or fluid.

In some cases where additives do give small but distinct bands, careful sample handling will permit quantitative estimation of additive content. Some examples of minor grease components that may be easily identified are glycerides (illustrated by the spectrum of the coconut oil solids in Figure 6) which give a sharp ester carbonyl band at 5.7 microns. Fatty acids, such as stearic acid, have a strong band at 5.8 microns. This band is valuable in identifying the presence of unsaponified or "free" fatty acid. Calcium hydroxide has a very sharp hydroxyl band at 2.7 microns while calcium carbonate has several sharp bands with the major band being at 11.45 microns. Representative spectra of these materials are also shown in Figure 5. Certain grease components, like anti-oxidants which normally make up less than 1 per cent of a grease, are often difficult or impossible to identify positively.

Water may often be identified in greases by its infrared absorption at 3 microns. Some attempts have been made to use the technique quantitatively.[6] However, the hydroxyl stretching bands for water are usually too broad for simple quantitative measurement of peak height, and there are other technical difficulties which make the method inconvenient.

Infrared Study of Grease Processing

Infrared spectra will reveal structural changes in processing of calcium acetate complex greases. One of the important steps in the process is dehydration. The spectra illustrated in Figure 6 show that the grease, while still under pressure in the saponification vessel, resembles hydrated calcium acetate. The finished grease has been dehydrated, and its spectrum resembles that of anhydrous calcium acetate. In particular, the bands in the 14 to 15 micron region are quite different for calcium acetate in the anhydrous and the hydrated

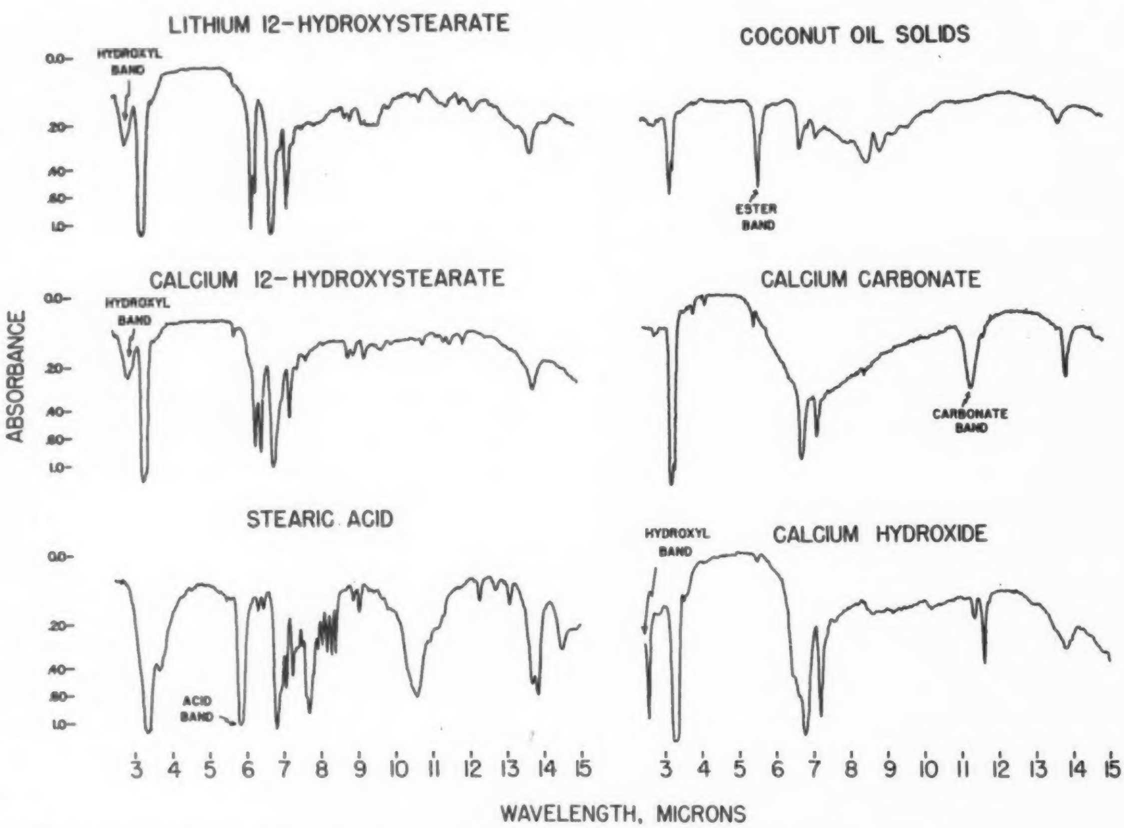

FIGURE 5—Infrared spectra of various thickeners and additives. (The spectra of the calcium 12-hydroxystearate, stearic acid, calcium carbonate and calcium hydroxide were determined in Nujol mulls.)

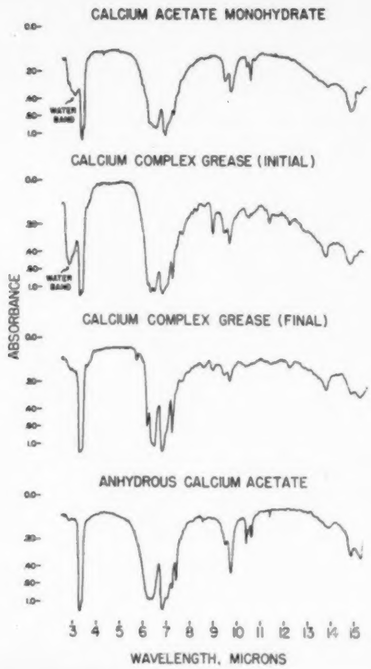

FIGURE 6—Infrared spectra of calcium acetates in Nujol and calcium complex greases.

forms. The remaining differences which exist are due to the other components of the complex.

Acknowledgment

The authors are indebted to Mr. Robert R. Gahtan for preparation and melting point measurements of the laurate soaps.

This investigation was supported in part by grants from the Socony Mobil Oil Co., Inc. to the friction and lubrication program, Research Division, Rensselaer Polytechnic Institute.

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W. H. BAUER *graduated from Oregon State college with a BS degree in chemical engineering in* 1929. *He received a PhD in physical chemistry from the University of Wisconsin. He was assistant instructor, University of Wisconsin* 1929-33; *research assistant* 1933-34; *instructor, Rensselaer Polytechnic Institute,* 1934-38; *assistant professor* 1938-42; *Captain, chemical warfare service, technical division research and development, U. S. Army; chief incendiary oil development section, pyrotechnic division; chief physical, analytical, and test divisions, Fred project rocket launching fuels,* 1942-45; *associate professor, Rensselaer Polytechnic Institute from* 1945-48; *he has been professor of physical chemistry and head of physical chemistry division* 1948-*date.*

About the Authors

D. B. COX *graduated with an AB degree from DePauw university in* 1948. *He received a MS degree in organic chemistry from Stanford university in* 1950 *and a PhD in organic chemistry from the University of New Mexico in* 1953. *He joined Socony Mobil Oil Co., Inc., in* 1953 *and has worked on grease research and development since then. He is presently a research associate at the Paulsboro laboratory, Paulsboro, N. J. He is a member of the American Chemical Society, Sigma Xi and Phi Lambda Upsilon.*

Literature and Patent Abstracts

Composition

Silica-Thickened Lubricating Grease Containing Alkylene Carbonate

According to Fronczak (U. S. Patent 2,939,840, assigned to The Pure Oil Co.) the proportion of finely-divided silica necessary to produce a given consistency lubricating grease is reduced if 10 to 30 per cent of alkylene carbonate, based on the weight of silica present, is added as a dispersant. The preferred additive is propylene carbonate.

Thus, 81.09 parts of a 200 viscosity neutral oil, 9.01 parts of 160 viscosity Bright Stock and 0.9 part of Ucon LB 550X were mixed and heated to 190 to 205°F. Then 9.0 parts of Cab-O-Sil were added to the hot fluid mixture while agitation was continued. After continued mixing, while the above temperature was maintained, for about 90 minutes the mass was passed through a colloid mill. The resulting lubricating grease had a worked penetration of 330.

Using a similar procedure and proportions of the same ingredients, except for the fact that propylene carbonate was substituted for the Ucon fluid, a lubricating grease was formed having a worked penetration of 251. While this latter product had excellent high temperature properties, it was not resistant to the action of water. However, the author states that the further addition of a high molecular weight polyalkylene glycol (Ucon fluid) will produce desired water resistance.

High Melting Point Lubricating Greases Containing Metal Salts

Grease-thickening compounds consisting of the metal salts of certain acidic reaction products permit formation of lubricating greases having dropping points above 500°F. Production of such compositions is described by Pattenden,

Bonmartini and Sproule in U. S. Patent 2,940,930, assigned to Esso Research and Engineering Co.

Preferred acidic reaction products are formed by reacting together about one mol of dicarboxylic acid, one mol of high molecular weight monocarboxylic acid and one mol of glycol. The reaction is effected by heating to 300 to 350°F for one to five hours and can be carried out in the presence of a mineral oil dispersant. While it is claimed that the metal salt thickeners may consist of those of alkaline earth metals or alkali metals, the examples given are lithium compounds.

Thus, a mixture of one mol of stearic acid, one mol of sebacic acid and one mol of ethylene glycol was heated for one hour at a temperature of 350°F. The resulting acidic reaction product was dissolved in lubricating oil, neutralized with lithium hydroxide, heated to 300°F to effect dehydration and cooled to room temperature. The resulting lubricating grease had a dropping point of 530°F and a worked penetration of 247 which changed to 263 at 104°F after 10,000 strokes. When tested at 150°F, the product absorbed 30 per cent water and then rejected additional water. No proportion of thickener was given, but similar products in which adipic and azelaic acids were used contained 13.6 and 16.4 per cent of the acidic reaction product.

Rheopectic Calcium 12-Hydroxy Stearate Lubricating Greases

Preparation of rheopectic calcium 12-hydroxy stearic is described by Nelson in U. S. Patent 2,940,931, assigned to Sinclair Refining Co. One of the essential steps in formation of a satisfactory product is to dehydrate a mixture of the soap and oil while the soap content is about 16 to 20 per cent and the temperature below about 260°F, followed by heating the dehydrated mixture to 285 to 295°F until the mass becomes soft. Also it is desirable that the oil used have a viscosity of 200 to 400 SUS at 100°F and be pour depressed to -25 to -35°F.

For example, 16 pounds each of 12-hydroxy stearic acid and water and 2.33 pounds of hydrated lime slurried in 48 pounds of oil of 308 SUS at 100°F, 95 VI (oil containing one per cent Acryloid 710) were mixed and heated to 160°F for 10 minutes before reapplying the heat and raising the temperature of the mass to 260°F. Here free water and a heavy soap emulsion were evident, which water disappeared after about one hour. Twenty-four pounds more oil were then added to give a soap concentrate of 18.2 per cent. The temperature was maintained at 255°F for about one hour to effect complete dehydration after which the temperature was increased slowly to 292°F where in a period of about two hours the consistency of the mass changed from hard to very soft. Next, with the heat off, 232 pounds of oil were added to reduce the soap content to five per cent. After cooling to 120°F, the product was milled at 0.02 clearance in a Charlotte colloid mill.

The lubricant then had a pour point of 5°F; SIL Mobilometer, 40 g. load 31 seconds and excellent Multi-luber test at -10°F.

Lubricants Containing Stabilized Dispersions of Calcium Acetate

Morway in U. S. Patent 2,940,932 (assigned to Esso Research and Engineering Co.) describes fluid or semi-fluid lubricants in which 5 to 40 weight per cent of calcium acetate is dispersed. Such dispersion is aided by the presence of 2 to 50 weight per cent of a synthetic ester. The final product has extreme pressure qualities and is much higher in viscosity than the base fluid.

For example, 10 weight per cent of di-(C_{10} Oxo) adipate and 40 weight per cent of a mineral oil, with a viscosity of 80 SUS at 210°F, were charged to a fire-heated kettle. To this fluid mixture was added 17 per cent of hydrated lime which was mixed to a smooth slurry before the addition of 25 per cent of glacial acetic acid. After this addition the temperature of the mass rose to 210°F. External heat was then applied to bring the mass to 310°F where it was held for about one hour to effect dehydration. The product was then allowed to cool to about 200°F and passed through a Charlotte mill, milling being an essential step in the preparation, to give a uniform lubricant.

The resulting semi-fluid product subjected to a 4-ball wear test at 1800 rpm, using a 10 kg load for one hour, permitted a scar of 0.32 mm. diameter. Similar compositions, only containing 7.5 per cent of acetic acid in the charge, had viscosities varying from 139 to 199 SUS at 210°F. The above samples, which of course contained some diester, showed no settling after being held in an oven at 210°F for five days, whereas when mineral oil alone was the fluid used some deposit did occur under this treatment.

Raw Materials

Amorphous Silicon Dioxide

German Patent 1,014,084, issued to General Electric Co. with Yer-

man as the inventor, describes the production of fine silica which is stated to be suitable for a thickening agent in silicone lubricants. To form this silica, a stream of finely dispersed silicon metal and pure oxygen are heated to 1000 to 1350°C for 1.6 to 3.7 seconds.

Tests

Determining the Rust-Preventive Properties of Lubricating Greases
V. M. Martynov and M. V. Morozova, Khim. i Tekhnol. Topliv i Masel 5, No. 3, pp 22-8 (1960).

An electrochemical method was used to determine the rust-preventive characteristics of lubricating greases. For the purpose a copper-iron thermocouple and a milliammeter sensitive to 0.02 ma. were used to determine the conductivity of the lubricant films. The effectiveness in preventing atmospheric corrosion of metals was indicated by a milliammeter-time curve. The tests were conducted in a bell jar under controlled humidity and in the presence of corrosive gases or vapors if desired. It was concluded that the corrosion products diffuse through the lubricating grease films.

Processing

Manufacture of Soap-Thickened Lubricating Greases

In British Patent 832,875, Socony Mobil Oil Co., Inc. describes a stepwise method of the production of soap-thickened lubricants, particularly lithium base products.

First, the soap is formed in the presence of all or a portion of the oil and a minor proportion of water. This step is conducted in an autoclave and at a temperature below the solution point of the soap in the oil. This wet soap-oil mass is then forced through atomizing nozzles into a second vessel where it is in contact with an atmosphere which will substantially dehydrate it. This substantially dehydrated product, still at a temperature below the solution point of the soap in the oil, is then subjected to a more intense atomization into a third vessel where it is contacted with a cooler surrounding atmosphere to effect heat exchange.

Increased yields are said to be possible with this method of processing. For example, a product with a worked penetration of 252 was made from the proportions below, all in weight per cent.

This lubricant was formed as follows. The fatty acids, lithium hydroxide and 37 per cent of the oil were charged to an autoclave and heated to 360°F for 1¼ hours. The

Hydrogenated Soya Fatty Acids	1.4
Hydrogenated Castor Oil Acids	5.4
Lithium Hydroxide Monohydrate	1.1
Antioxidant	0.2
Naphthenic Oil, 750 SUS at 100°F	91.9

resulting soap-oil mixture, containing 2.1 per cent water, was atomized into another vessel through an orifice having a diameter of 0.29 inch. The material collected in the second vessel had a moisture content of 0.2 per cent. The remainder of the mineral oil was added at this point while the mass had a temperature of about 300°F. Finally, the mass was atomized more intensely through a nozzle having a core with four grooves, each 0.020 by 0.035 inches in cross section. The orifice diameter was 0.051 inch and the pressure at the nozzle was 900 to 1200 psi. The atomized product was cooled to 135°F before deaerating and packaging.

The same procedure was used in preparing a lithium-calcium base lubricating grease from the following weight per cents of ingredients:

Palmitic Acid	0.49
Stearic Acid	6.30
Oleic Acid	0.21
Lithium Hydroxide Monohydrate	0.848
Hydrated Lime	0.368
Mixture of mono and diheptyl dipenylamines	0.2
50% Oil Blend of Reaction Product of Naphthenic Acid and Diethylene Triamine	2.0
Naphthenic Oil, 750 SUS at 100° F	58.23
Naphthenic Oil, 135 SUS at 210° F	31.354

This gave a lubricant containing 0.10 per cent water and with a worked penetration of 287, which had a leakage of 1.5 grams in a Wheel Bearing Test.

Application

Radiation-Resistant Lubricants

Nucleonics v. 18, No. 2, February 1960, pp. 67-71. William L. R. Rice, David A. Kirk, William B. Chesey, Jr.

Several solid-film lubricants, lubricating greases and fluids were tested for their radiation resistance and high-temperature stability. Previous investigations were also mentioned and 23 references are given.

According to these authors, the primary drawback until recently in the development of a good high-temperature lubricating grease has been the lack of satisfactory lubricating fluids. They consider that thickeners have been available for several years which possess thermal stability in excess of any usable base fluid. To illustrate this point results are shown for four lubricating greases tested as in Federal Test Method Standard No. 791-333T at 10,000 rpm and unless noted at 600°F. One product was a soap-thickened mineral oil which failed in a maximum of 33.5 hours when not subjected to radiation and in about half this time when radiation was used. The remaining three lubricants contained silicone oil and arylurea, copper phthalocyanine and dye respectively as the bodying agent. The first of the lot, when run at 450°F failed in an average time of 458 hours but when subjected to radiation dosage, in ergs/gmC, of 1.44×10^{10} failed at 320 hours. The second of the lubricants containing silicone fluid failed after 80 hours (average of two runs) and after 240 hours at 450°F. This stood a radiation dosage of 1.25×10^{10} at 450°F for 235 hours. The last of the series failed in 56 hours (average of two runs) and in 200 hours when a radiation dosage of 8.80×10^{9} was applied.

While no data are given on lubricating greases in which polyphenyl ethers are used as the lubricating fluid, these base fluids are so promising that the following statement is made: "Greases should be available in the very near future which will allow extended operation at temperatures as high as 800°F and down to 0-50°F."

One of these polyphenyls, namely m-bis (m-phenoxyphenoxy) benzene, is compared with MIL-L-7808 jet-engine oil in current use. The ether is said to have a useful temperature range about 200°F greater than the 7808 oil with an upper temperature limit almost 300°F. Also it has only 4 per cent of the volatility of the engine oil and forms only 1 per cent as much coke at 800°F. Further, the oxidation stability of the ether is over 1,000 times as great as the 7808 oil and also five to ten times more resistant to radiation.

Ford Eyes Lubeless Bearings

National Petroleum News, July 1960, page 108, mentions the possibility that 1961 Fords and Ford Falcons may use Teflon-type lubeless bearings in steering system and front suspensions. Greasing intervals on remaining points would then be upped to 10,000 miles. The cost may be a decisive factor since Teflon bearings would cost "several dollars per car" more than the type in use at present.

People in the Industry

Edward M. Cabaniss

Edward M. Cabaniss, formerly president of the Joseph Dixon Crucible Co., Jersey City, N. J., died of a heart condition at Doctors hospital, Washington, D. C., in late September. He was 75 years old. Until his retirement several years ago, he resided in New York City.

Mr. Cabaniss, the son of an army officer, was born on an army post, Fort Assinibone, in Montana. He attended Hamden Sidney college in Virginia.

He was with the Joseph Dixon Crucible Co. for 36 years, joining the company as assistant to the president and serving successively as vice-president in charge of manufacturing, vice-president, executive vice-president, president, and chairman of the board. He retired as board chairman last May.

ASTM Selects New Executive Secretary

Thomas A. Marshall, Jr., has been elected executive secretary of the American Society for Testing Materials by its board of directors, effective October 15, 1960, it has been announced by Dr. A. Allan Bates, president of ASTM. Mr. Marshall was senior assistant secretary of the American Society of Mechanical Engineers.

As executive secretary of ASTM, Mr. Marshall will head a staff which supports a society of 10,500 members and 6000 additional committee members. Through its organization of some 85 technical committees, ASTM devotes its efforts to the stimulation of research and to the development of standard specifications and methods of test for materials.

Dr. Bates also announced that Fred F. Van Atta, formerly assistant secretary of ASTM, was elected to the post of treasurer with responsibility for the business operations of the society. Robert J. Painter, formerly executive secretary and treasurer, will continue as consultant to the executive secre-

tary. He will be especially concerned with the society's long-range planning program. Raymond E. Hess will continue as associate executive secretary. As technical secretary and editor-in-chief, Mr. Hess is responsible for the technical activities and publications of the society.

Ralph Matthews Retires As IOCA Secretary

Ralph R. Matthews

Ralph R. Matthews, is retiring. The veteran lubrication executive who managed the affairs of the Independent Oil Compounders Association has been in poor health for the past few months and will become honorary executive secretary of IOCA, while an executive secretary will carry on the duties of the office (*see right*). Ralph, 77, will be retained for advice and consultation.

After a lifetime in the lubricants industry, including many years of service to NLGI on early program committees during the years 1936-1943, Ralph retired as executive vice-president of Battenfeld of Kansas City in 1950. Shortly thereafter, he was appointed executive secretary of the Compounders and has served in that capacity for ten years.

The many firm friendships he had formed and kept throughout the industry were of value to Ralph in his association work, for through the medium of IOCA he was able to retain close relations with the fine combination of business and pleasure he so enjoyed.

The Compounders benefited too, for IOCA more than doubled in the ten years Ralph guided it, while the bimonthly magazine IOCA COMPOUNDINGS enjoyed similar growth. Along with Mrs. Matthews, Ralph used his hobby of travel as a means of maintaining contact with his friends. Business correspondence was also conducted in the same warm vein.

Ill health last summer brought a strain on Ralph which was alleviated when T. W. H. Miller of NLGI temporarily stepped in and assisted with IOCA affairs. When it became apparent Ralph might permanently endanger his health by continuing to carry a full load, the decision was reached to ease the burden yet retain Ralph's experience on a consulting basis.

Friends who might wish to write him may contact Ralph at the IOCA office or the home, 5040 Brookside, Kansas City 12, Mo.

Dan Maurin Elected President of IOCA, Harry E. Tatman Is Executive Secretary

Dan Maurin, vice-president of Mid-West Oil company, Kansas City, Kansas, was elected president of the Independent Oil Compounders Association at the recent annual meeting in Highland Park, Illinois. He had previously served as IOCA treasurer for six years.

Vice-president-elect is Paul T. Webster, Jr., president of Central Petroleum company in Cleveland. The new treasurer is R. W. Gober, vice-president of Georgia-Carolina Oil company, Macon, Georgia. IOCA's newly-appointed executive secretary is Harry E. Tatman, who will succeed Ralph R. Matthews, who is retiring.

Tatman was associated with the National Refining company for over 25 years and prior to his retirement, was vice-president of Jesco Lubricants in Kansas City. He is a member of the Twenty-Five Year club of the petroleum industry, and the Kansas City Oil Men's club. His appointment with IOCA took effect October 15.

Named to Technical Sales-Service Post

Howard F. Krickl, for fifteen years a packaging engineer in the petroleum industry and academically trained in industrial packaging technology, has been named to head technical sales-service at Vulcan Containers Inc., Bellwood, Ill., manufacturer of steel pails, drums and tinplate cans.

In technical sales-service, Krickl will be in a position to apply his wide knowledge of packaging of all types for the benefit of container users. His extensive background in metal container packaging enables him to counsel effectively in the marketing of a wide variety of industrial products.

Krickl was appointed to the post to provide liaison with packaging development engineers, increasingly being employed by the industries Vulcan serves. In addition to his technical background, Krickl is thoroughly conversant with rapidly changing trends in industrial packaging.

Vulcan Containers, 44-years-old this year, manufactures more than twenty different sizes of steel pails and drums and specializes in the development of protective interior linings for a wide range of hard-to-hold products. The company serves the container needs of many major manufacturers in the paint, petroleum products, adhesives, food and chemical industries.

In addition to his other duties, Krickl will represent the company in such organizations as the National Institute of Packaging and Handling Logistics Engineers and the Packaging Institute.

Prior to joining Vulcan, Krickl was with the Acme Barrel Co., Inc., and previous to that, he was a packaging engineer with the Standard Oil Co. (Ind.) for fifteen years. He is a graduate of the packaging technology course, Purdue university and has completed several college-level business and technical courses.

Dr. R. E. Fariss Named by Hulburt

Dr. Robert E. Fariss has been named director of research for Hulburt Oil & Grease Co., Philadelphia. Dr. Fariss graduated from Rice Institute in 1942 with the degree of Bachelor of Science in chemical engineering. In 1950 he received the degree of Doctor of Philosophy, majoring in physical chemistry, from Rice.

Dr. Fariss has been active in the National Lubricating Grease Institute and has presented two fundamental papers on the organophilic bentonites to this organization. His experience has included all phases of research on the inorganic thickening agents. He is also a member of the American Chemical Society and the American Institute of Chemical Engineers. Dr. Fariss is a veteran of World War II, having attained the rank of Lieutenant, j. g., with the United States Naval Reserve.

Harvey Ragan Celebrates 50th Year with Dixon

Harvey Ragan, northern New Jersey sales representative for the paint and lubricants divisions of the Joseph Dixon Crucible company, Jersey City, N. J., is currently celebrating his 50th year with the company.

In addition, he has also become a 50 year club member of the National Paint, Varnish and Lacquer association.

District Sales Manager For American Potash

John R. Jones has been named New York-New England district sales manager for American Potash & Chemical Corp., according to Dr. A. J. Dirksen, general sales manager, eastern.

Jones will continue to headquarter out of the firm's eastern general sales offices in New York.

Industry News

Establishes Midwest Tech-Service Center

Establishment of a branch office and technical service center at 2645 West Peterson Ave., Chicago, is announced by the Alpha-Molykote Corp., Stamford, Conn., the world's largest producer of molybdenum disulfide specialty lubricants. Mr. R. B. Dost, formerly president of R. B. Dost, Inc., Chicago, has been named midwest district manager.

The new technical service center will provide expanded engineering assistance in the solution of lubrication problems to industry in Illinois, Wisconsin, Minnesota, Iowa, Missouri, Indiana and Western Ohio, for Molykote lubricants, especially in extreme pressure and high temperature applications, throughout industry.

Bulk Grease Handling AISE Convention Feature

Considerable interest was given to an expanding trend toward bulk grease handling in the steel industry, at the 1960 Iron & Steel convention and exposition in Cleveland, September 27 through 30. One of the featured displays was based on equipment now available.

A technical paper entitled "Grease on Tap" was given by Charles A. Bailey, lubrication engineer, National Tube division and Donald R. McCaa, product manager, Standard Products department, American Bridge division of United States Steel corporation.

The technical paper pointed out that increasing interest in bulk grease handling in steel mills is the result of improved lubricants, methods of application and containers now available. Methods, practices and container designs were analyzed to show how every mill can have "grease on tap."

Godfrey L. Cabot and Subsidiaries Merge

As of midnight, September 30, 1960, Godfrey L. Cabot, Inc., and also Cabot Carbon company, Cabot Shops, Inc., and Cabot Gasoline corporation (three subsidiaries of Godfrey L. Cabot, Inc.), were duly merged into Cabot corporation, a Delaware corporation recently organized as a wholly-owned subsidiary of Godfrey L. Cabot, Inc. for the purpose of the merger. Consequently, Cabot corporation, the surviving corporation, has acquired all of the assets and has assumed all of the liabilities of Godfrey L. Cabot, Inc., Cabot Carbon company, Cabot Shops, Inc. and Cabot Gasoline corporation.

No change has been made in operating procedures, personnel or location of offices, and all the functions and business activities formerly conducted by Godfrey L. Cabot, Inc., Cabot Carbon company, Cabot Shops, Inc. and Cabot Gasoline corporation will hereafter be performed and conducted by Cabot corporation. Consequently, the only significant effect of the merger, insofar as business associates and third parties are concerned, is to substitute Cabot corporation for Godfrey L. Cabot, Inc., Cabot Carbon company, Cabot Shops, Inc. and Cabot Gasoline corporation.

Monsanto Completes Laboratory Expansion

Monsanto Chemical Co. has completed an expansion of its research engine laboratory in St. Louis, which more than doubles its previous capacity for full-scale engine evaluation of chemical additives in motor oils, gear lubricants, automatic transmission fluids and fuels.

Facilities of the laboratory have been expanded to include an additional battery of highly instrumented engine test cells as well as a photo room, an enlarged engine rebuilding shop, garage and storage facilities.

The laboratory is operated by Monsanto's organic chemicals division, a major supplier of additives to oil refiners, to carry out research on new chemicals for petroleum products and to provide customer technical service in qualifying new lubricant formulations. It is reported to be one of only four industrial laboratories in the United States approved by the U. S. Ordnance Department to carry out qualifying tests on gear lubricants.

Evaluation of new additives and new lubricant formulations is carried out at the laboratory in a variety of full-scale test equipment including several types of diesel engines, both one-cylinder and modern, multi-cylinder automotive engines, two-cycle engines, automatic transmission test stands and a gear test rig.

Monsanto attributes its major expansion of the research engine laboratory both to its increasing participation as a supplier of additives for petroleum products and to a rapid growth of technology in the field, paced by changing automotive equipment requirements and public driving habits.

The performance of modern petroleum products is fortified by a variety of chemical additives including combustion deposit modifiers, corrosion inhibitors, anti-oxidants, foam inhibitors, anti-wear agents, extreme pressure additives, detergent-dispersants, viscosity index improvers and pour point depressants.

The petroleum industry reports that the sale of chemical additives for motor oils and other lubricants in 1959 topped $175 million. Motor oil detergents such as those marketed by Monsanto under the Santolube trademark accounted for approximately $70 million of this total. Industry sources predict that sales of these additives will continue to increase at an annual rate of 5 per cent over the next decade.


cutting oil
BRIGHTENING
BEFORE
AFTER
BEFORE
AFTER